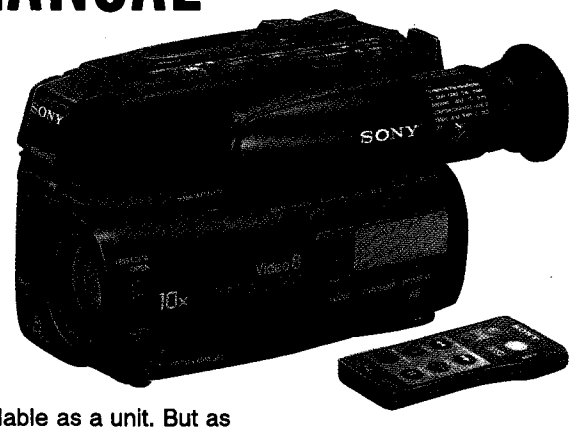
CCD-TR71
RMT-701

SERVICE MANUAL

US Model
Canadian Model



Remote commander is available as a unit. But as individual parts the battery case lid of commander is only avaiable.

Video8 Handycam

FL MECHANISM

For MECHANISM ADJUSTMENTS, refer to the "8 mm Video MECHANICAL ADJUSTMENT MANUAL II " (9-972-705-11).

SPECIFICATIONS

System

Video recording system	Four Rotary heads, Helical scanning FM system
Audio recording system	Rotary head, FM system
Video signal	NTSC color, EIA standards
Usable cassette	8 mm video format cassette (standard 8 mm)
Tape speed	SP mode: Approx. 1.43 cm (19/32 inches) /sec LP mode: Approx. 0.72 cm (5/16 inches) /sec (playback only)
Recording time	SP mode: 2 hours (P6-120)
Playback time	SP mode: 2 hours (P6-120) LP mode: 4 hours (P6-120)
Fastforward/rewind time	Approx. 8 min. (P6-120)
Image device	CCD (Charge Coupled Device)
Viewfinder	Electronic viewfinder (monochrome)
Lens	Combined 10 × power zoom lens f = 6.2 to 62 mm (1/4 to 1 7/16 inches) F 1.6 (44.6 to 446 mm when converted to a 35 mm still camera) Filter diameter 37 mm (1 1/2 inches) TTL autofocus system inner focus wide macro system
Color temperature	Auto
Minimum illumination	2 lx (F 1.6)
Illumination range	2 lx to 100,000 lx
Recommended illumination	More than 100 lx

Input and output connectors

Video input/output	Selectable with the video/audio INPUT/OUTPUT selector Phono jack, 1 Vp-p, 75 ohms, unbalanced, sync negative
Audio input/output	Phono jacks, (2: stereo L and R) Input: −7.5 dBs, input impedance more than 47 kilohms Output: −7.5 dBs, (at output impedance 47 kilohms) impedance less than 2.2 kilohms
RFU DC OUT	Special mini-jack, DC 5 V
Remote jack	Stereo mini-mini-jack (Ø 3.5)
MIC jack	Stereo mini-jack, −66 dBs low impedance with 2.5 to 3 V DC, output impedance 6.8 kilohms (Ø 3.5)

— Continued on next page —

MICROFILM

8 VIDEO CAMERA RECORDER

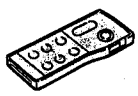
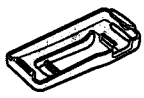
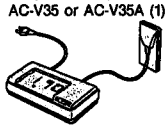
SONY®

General

Power requirements
On battery mounting surface
6.0 V (battery pack)
7.5 V (AC power adaptor)
Average power consumption
5.8 W (camera recording) including the viewfinder
Installation Vertically, Horizontally
Operating temperature
0 °C to 40 °C (32 °F to 104 °F)
Storage temperature
−20 °C to +60 °C (−4 °F to 140 °F)
Dimensions Approx. 105 × 99 × 173 mm (w/h/d) (4 1/4 × 4 × 6 7/8 inches)
Weight Approx. 650 g (1 lb 7 oz) excluding the battery pack, lithium battery, cassette, jack cover, and shoulder strap
Approx. 870 g (1 lb 14 oz) including the battery pack NP-55, lithium battery CR2025, cassette P6-120, jack cover, and shoulder strap
Microphone Electret condenser microphone, stereo type

Design and specifications are subject to change without notice.

Supplied accessories

• Wireless Remote Commander (1) 	• Remote Commander Holder (1) 	• Battery pack NP-55 (1)
• AC power adaptor AC-V35 or AC-V35A (1) 	• Lithium Battery CR2025 (2) (for camcorder/for the Remote Commander)	• RFU adaptor RFU-90UC (1)
• Shoulder strap (1)	• Jack cover (1) (attached to the camcorder)	• A/V connecting cable (1)

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

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There is the color reproduction standard frame at the back of the book.

SERVICE NOTE

[SEMICONDUCTOR FOR CORRECTION LIST DISPLAY]

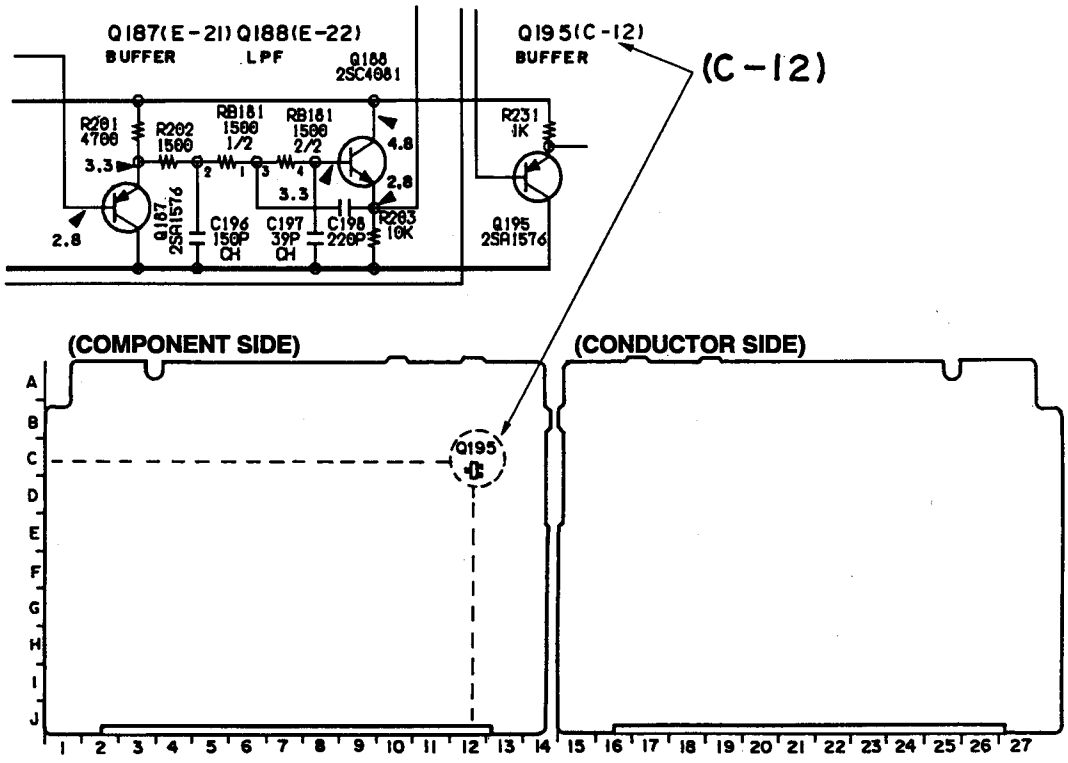
Part code and part name of the semiconductor for correction of the print board is discribed in the space of each print figure. Use this list when ordering parts.

[PARTS LOCATION DIAGRAM RELATED TO POWER SUPPLY]

The parts location diagram for the power supply which are often checked and replaced when repairing the fuse and IC link and so on. (See pages 108 and 120.)
This diagram is useful for repair.

[SEMICONDUCTOR LOCATION]

In this service manual, the mounted locations of the semiconductors (IC, transistor, diodes) are indicated in red as shown below. This enables to find the location on the board easily when servicing.



[HEAD CLEANING]

After an extended period of use the video image may become indistinct or may not appear at all during playback of a tape. The cause of this usually are dirty video heads. For remedy, cleaning of the heads is required.

Check for Head Clogs During Recording

① Use a blank tape, record a short section, then press the stop button to stop.
② Set to recording mode again.
③ If the [⊗] mark is flashing in the viewfinder at this time, head clogs are occurred.

Check During Playback of a Tape

① Play back a pre-recorded tape and display the image on a TV screen.
② If there is no sound and the image is unstable, no image appears on the screen, or tape transport is unstable, head clogs are occurred.

Remedy

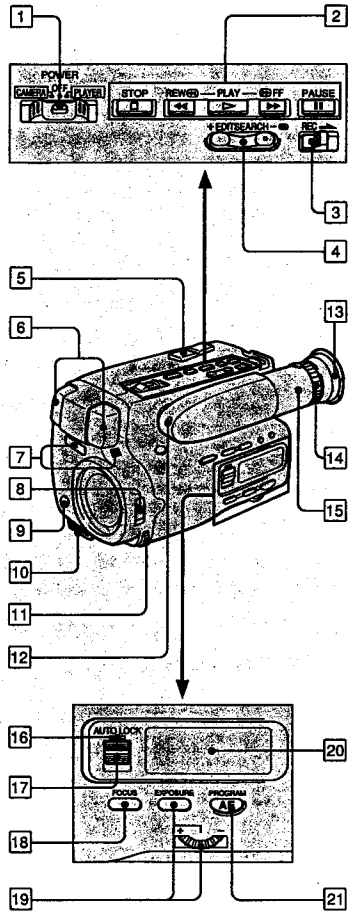
[Cleaning method using a cleaning tape]

- Use the Cleaning Tape. (Please follow the instructions attached to the cleaning tape.)

SECTION 1
GENERAL

This section is extracted from instruction manual.

Identifying the Parts



For details on the use of each part, refer to the pages indicated in the parenthesis.

1 POWER switch

2 Tape transport buttons
- □ STOP (stop)
- ◀◀ REW (rewind)
- ▷ PLAY (palyback)
- ▶▶ FF (fast forward)
- ❚❚ PAUSE (pause)

3 REC (recording) switch

4 EDITSEARCH button

5 Power zoom button

6 Built-in microphone (stereo)

7 Remote control sensors

8 LENS COVER switch

9 FADER button

10 Instant stand

11 Focus dial

12 Camera recording/battery lamp

13 Eyecup

14 Viewfinder lens adjustment ring

15 Viewfinder

16 AUTO LOCK mark

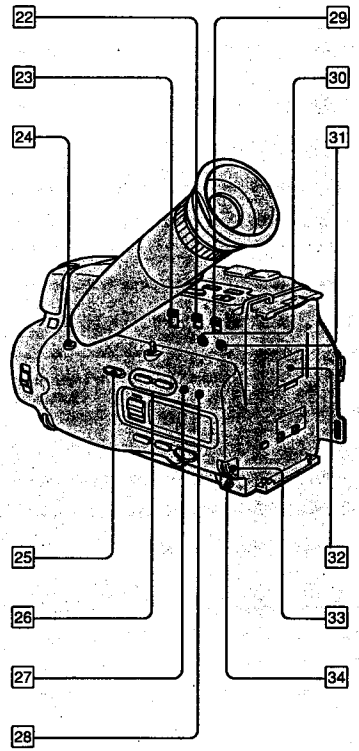
17 AUTO LOCK switch

18 FOCUS button

19 EXPOSURE button and dial

20 Display window

21 PROGRAM AE button



22 Remote Commander ON/OFF switch

23 HI-FI SOUND switch

24 PUSH FOCUS HOLD button

25 DIGITAL PICTURE button

26 DATE and TIME buttons

27 COUNTER RESET button

28 ZERO MEM (zero memory) button

29 EDIT switch

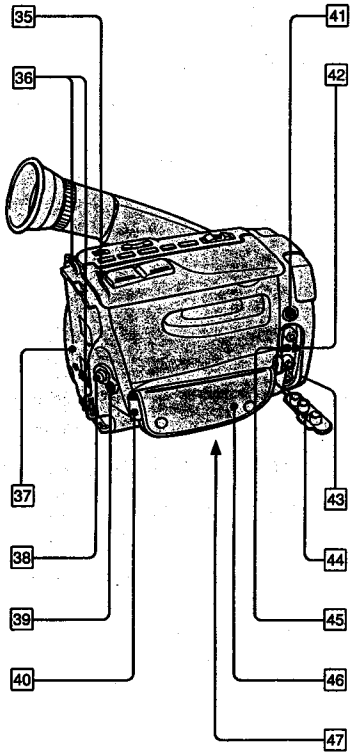
30 DST button

31 AREA button

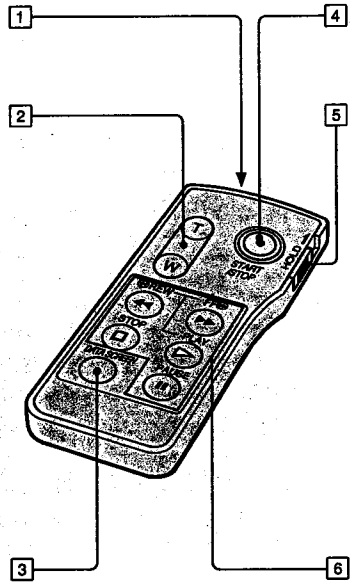
32 Lithium battery compartment

33 BATT (battery eject) knob

34 REMOTE control jack (stereo mini-mini-jack)



35 EJECT button (below the lid)
36 Hooks for shoulder trap
37 Battery mounting surface
38 START/STOP button
39 STANDBY switch
40 Grip strap
41 MIC jack (PLUG IN POWER) (stereo mini-jack)
42 VIDEO/AUDIO INPUT/OUTPUT selector switch
43 VIDEO/AUDIO jacks (phono jacks)
44 Jack cover
45 RFU DC OUT (DC output) jack
46 Grip strap cover
47 Tripod receptacle



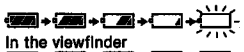
1 Transmitter
2 Power zoom button
3 DATA SCREEN button
4 START/STOP button
5 HOLD switch
6 Tape transport buttons
◀◀ REW (rewind) button
▶▶ FF (fast forward) button
□ STOP button
▷ PLAY (playback) button
II PAUSE button

Indicators in the Viewfinder and in the Display Window

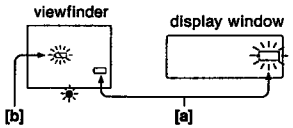
Warning Indicators

If indicators flash in the viewfinder or in the display window or a caution lamp on the camcorder flashes, check the following:

Battery life indicator
[a] In the display window

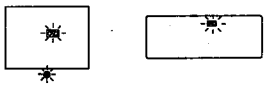


In the viewfinder

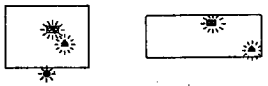


[b] Slow flashing: The battery is weak.
Fast flashing: The battery is dead.

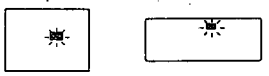
The tape is near the end.



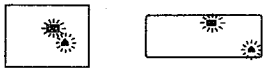
The tape has run out.



No tape has been inserted.



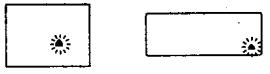
The tab on the tape is out (red).



Moisture condensation has occurred.

The video heads may be contaminated.

Some other trouble has occured.
Disconnect the power source and contact your Sony dealer or local authorized facility.

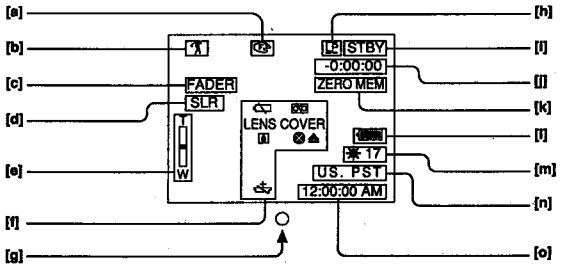


The lithium battery is weak.

LENS COVER switch is set to CLOSE.

In the Viewfinder

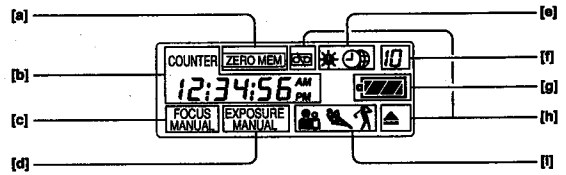
For details on each indicator, refer to the pages idicated in the parenthesis.



[a] Manual focusing ( ) (34), (35)
[b] PROGRAM AE Indicator (37)
[c] FADER has been pressed. (39)
[d] Digital picture mode indicator (38)
[e] Power zoom indicator (17)/Exposure Indicator (36)
[f] Warning indicators (58)
[g] Lights up during recording.
When flashing: "Change battery or cassette"
[h] Lights up when playing back a tape recorded in LP mode (48)
[i] Tape transport mode (19), (42)
[j] Tape counter (15), (44)
[k] ZERO MEM is pressed. (28), (44)
[l] Battery life indicator (9), (58)
[m] Area number (10), (31)
[n] Area name (10), (31)
[o] Date or Time (10)

In the Display Window

For details on each indicator, refer to the pages indicated in the parentheses.



[a] ZERO MEM is pressed. (28), (44)
[b] Date, time or tape counter indicator (10), (15), (44)
[c] Manual focusing (34), (35)
[d] Adjusting exposure manually (36)
[e] World clock indicator (11), (30)
[f] Area number (10), (31)
[g] Battery life indicator (9), (58)
[h] Warning indicators (58)
[i] PROGRAM AE Indicators (37)

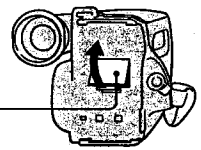
Inserting the Lithium Batteries

Your camcorder is supplied with two lithium batteries. One is for the camcorder, and the other is for the Remote Commander.
Well, the lithium battery has a positive (+) side and a negative (−) side as illustrated below. **Be sure to install the lithium battery with the positive side facing out.**

Inserting the Lithium Battery into the Camcorder

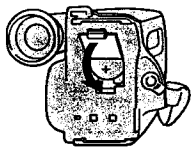
To activate the clock and the world clock, you must insert a lithium battery. Make sure you use one of the supplied lithium batteries.

1 **Open the lid of the lithium battery compartment.**



2 **Install one of the supplied batteries with the positive (+) side facing up.**

3 **Close the lid.**



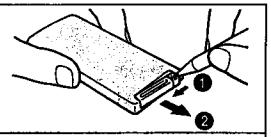
To change the lithium battery

Remove the battery pack (see page 9), open the lid of the lithium battery compartment, and replace the lithium battery with a new one.
After replacing the battery, readjust the date and time.

Inserting the Lithium Battery into the Remote Commander

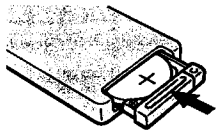
First, you have to insert the lithium battery into the Remote Commander. Use one of the supplied CR2025 lithium batteries.

1 **Pull out the lithium battery holder from the Remote Commander.**



2 **Insert the lithium battery with the + (plus) side facing upward.**

3 **Put the lithium battery holder back into the Remote Commander.**

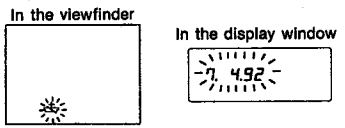


To replace the lithium battery

Remove the lithium battery holder from the Remote Commander, and pull out the lithium battery, and insert a new one. **Replace the battery with a Sony CR2025 or Duracell DL-2025 lithium battery. Use of another battery may present a risk of fire or explosion.**

Lithium battery life

The battery for the camcorder lasts for about 1 year, and the battery for the Remote Commander lasts for about 6 months under normal operation. When the lithium battery becomes weak, the time indicator keeps flashing in the display window and the indicator flashes in the viewfinder for about 5 seconds when you set the POWER switch to CAMERA. In this case, **replace the battery with a Sony CR2025 or Duracell DL-2025 lithium battery. Use of another battery may present a risk of fire or explosion.**



WARNING

Battery may explode if mistreated. Do not recharge, disassemble, or dispose of in fire.

Caution

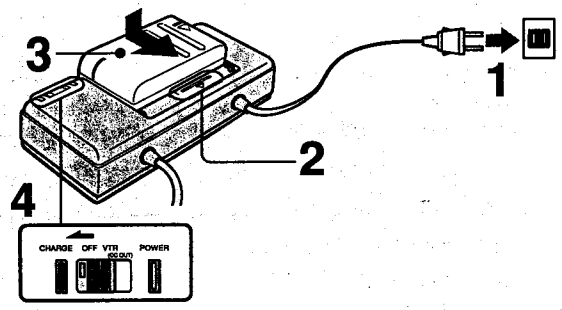
Keep the lithium battery out of the reach of children.
Should the battery be swallowed, consult a doctor immediately.

Charging and Installing the Battery Pack

Before you can use your camcorder, you first need to charge and install the battery pack.

Charging the Battery Pack

To charge the battery pack:



1	**Plug the AC power adaptor into a wall outlet.**
2	**Align the flat side of the battery pack with the line on the AC power adaptor.**
3	**Push down and slide the battery pack in the direction of the arrow.**
4	**Set the selector to "CHARGE" position.**

When charging is finished, the charge lamp goes out.

Type of battery pack	NP-55 (supplied)	NP-77HD	NP-77H	NP-77	NP-66H	NP-55H
Required charging time	60	140	140	120	110	70
Battery life	55	120	120	105	90	65

(approx. minutes using AC-V35 or AC-V35A)

Important!

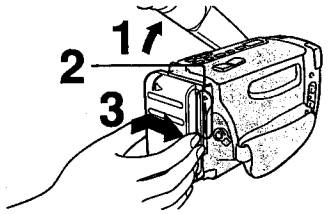
Use the battery completely before re-charging!

Before you recharge the battery, make sure the battery has been used (discharged) completely. Excessive charging may reduce the charging capacity of the battery.

To use up the battery, remove the cassette and slide the POWER switch to CAMERA with the battery attached, and leave the camcorder until the ⏀ indicator and a red lamp flash in the viewfinder.

Installing the Battery Pack

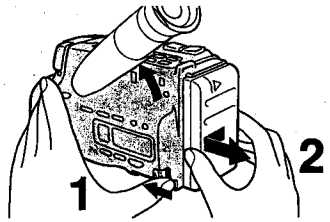
When you have finished charging the battery, install the battery pack as follows:



1	**Lift up the viewfinder.**
2	**Align the right side of the battery pack with the white line on the camcorder.**
3	**Slide the battery pack to the right.**

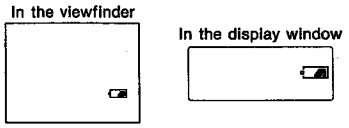
To remove the battery pack

Lift up the viewfinder, and press BATT in the direction of arrow (1) and, at the same time, slide out the battery pack to the left (2).



Battery life indicator

You can check the remaining battery capacity with the battery life indicator in the viewfinder and in the display window. The decreasing black bar indicates decreasing battery power.

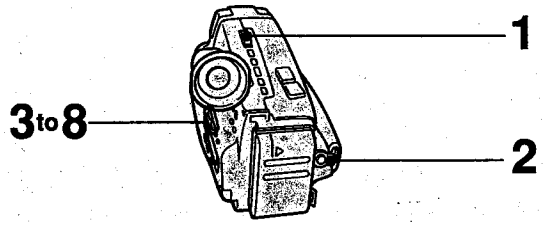


Note

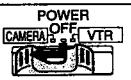
The battery life indicator of the camcorder may indicate a different remaining capacity from that of the NP-77HD battery pack. The indicator of NP-77HD is more accurate.

Setting the Date and Time

You need to set the camcorder's date and time to put the correct ones onto your video. Make sure that the power source and lithium battery are installed. Make settings looking at the display window. To check the area name, look into the viewfinder. About the world clock, see page 30.



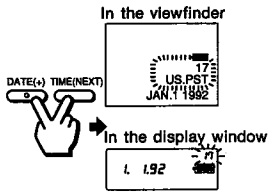
1 **While pressing the small green button on the POWER switch, slide it to CAMERA.**



2 **Turn the STANDBY switch up.**

3 **Press DATE (+) and TIME (NEXT) simultaneously for at least 2 seconds until the area name and number appear in the viewfinder and the area number appears in the display window.**

DATE now functions as + (to advance numbers) and TIME functions as NEXT (to set).



4 **Press DATE (+) to select your area name.**

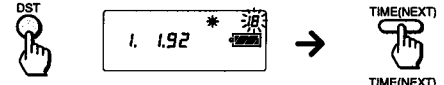
The time zones and area names are numbered as follows:

Time Zone	Area Name	Area Number
Hawaii Standard Time	HAWAII	15
Alaska Standard Time	ANCHRGE	16
Pacific Standard Time/West Canada	US. PST	17
Mountain Standard Time	US. MST	18
Central Standard Time	US. CST	19
Eastern Standard Time/East Canada	US. EST	20

5 **Choose one of the following options to set the clock:**

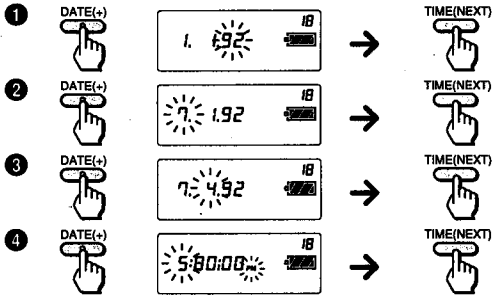
(a) For Daylight Savings Time, press DST. Then press TIME (NEXT).

The ✳ indicator appears in the viewfinder and in the display window.



(b) For standard time, press TIME (NEXT).

6 **Adjust the flashing digits of the year, month, day and hour by pressing DATE (+) and TIME (NEXT).**



Note:

- When you keep DATE (+) depressed, the digits advance faster.

7 **Adjust the flashing digits of minute by pressing DATE (+).**

8 **Press TIME (NEXT) to set the second to "00". The clock starts working.**

To correct the date and time settings

Press TIME (NEXT) repeatedly until the minute digits stop flashing. Then repeat step 3 to 8.

To check the preset date and time

Press DATE (+) or TIME (NEXT). When you press the same button again, the indicator goes off.

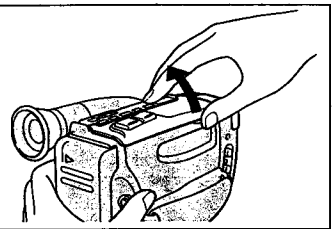
To reset to standard time

Press DST. The ✳ indicator goes off.

Inserting a Cassette

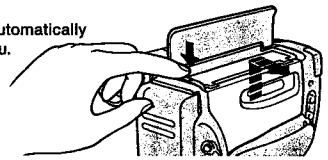
This section shows you how to insert a cassette.
Make sure that the power source is attached before you insert a cassette.

1 **Lift up the lid at the indentation point.**

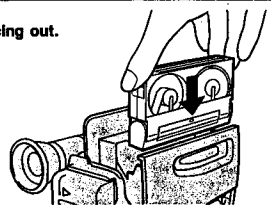


2 **Press EJECT.**

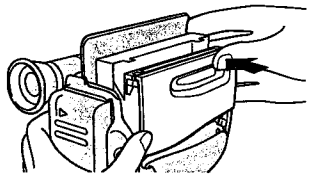
The cassette compartment automatically lifts up and opens toward you.



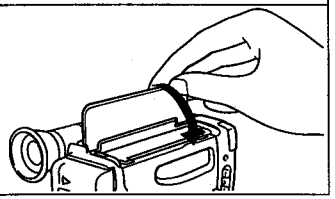
3 **Insert the cassette with the window facing out.**



4 **Press the PUSH mark on the cassette compartment cover to close it.**

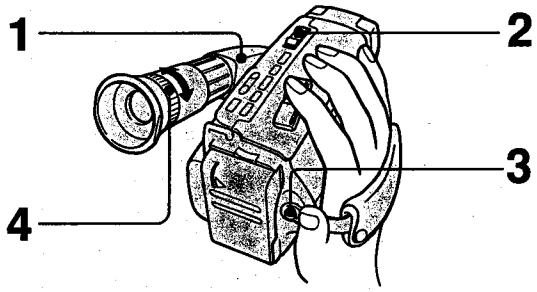


5 **Close the lid.**

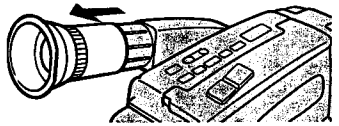


Adjusting the Viewfinder Lens

Before you use the camcorder for the first time (or after someone else has used it), adjust the viewfinder lens to best fit your eyesight. Make sure that the power source is attached to the camcorder, and a cassette is inserted.



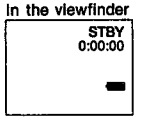
1 **Pull out the viewfinder until it clicks.**



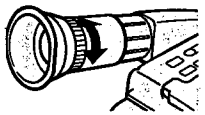
2 **While pressing the small green button on the POWER switch, slide it to CAMERA.**

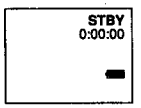
3 **Turn the STANDBY switch up.**

In the viewfinder



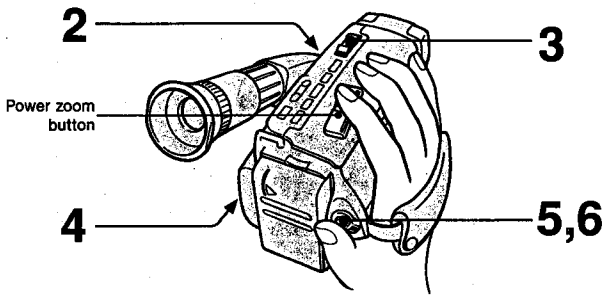
4 **Turn the viewfinder lens adjustment ring so that the "STBY" indicator in the viewfinder screen comes into sharp focus.**





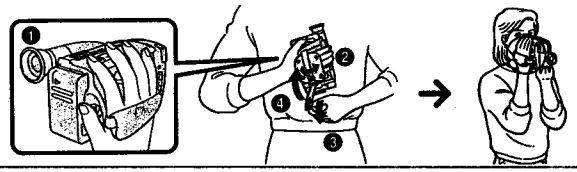
Camera Recording

This section describes the basic procedures for recording.
Make sure that the viewfinder is pulled out and a battery pack (see page 9) or other power sources (see page 24) are attached. Before you record one-time events, you may want to make a trial recording to make sure that the camcorder is working perfectly.



1 **Hold the camcorder as described below.**

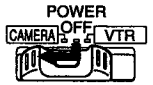
Put your hand through the grip strap, hold your camcorder against your body and pull the strap upward. Check that your thumb can easily touch START/STOP.



2 **Slide the LENS COVER switch to OPEN.**

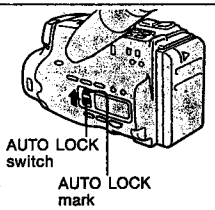
Note that the camcorder doesn't start recording while the lens cover is closed.

3 **While pressing the small green button on the POWER switch, slide it to CAMERA.**



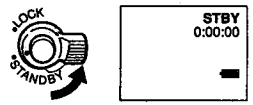
4 **Slide the AUTO LOCK switch up so that the AUTO LOCK mark (green) appears.**

This switches all the camera functions to automatic (i.e. autofocus, auto exposure).



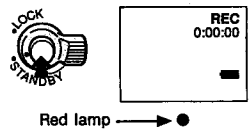
5 **Turn the STANDBY switch up.**

"STBY" and the battery life indicator appears in the viewfinder. Now you can see through the viewfinder.



6 **Press START/STOP once.**

The camcorder is recording when the "REC" indicator appears and the red lamp lights up in the viewfinder.



In the viewfinder, you can see a black and white picture of what you are recording and information that indicates what the camcorder is doing.

To stop recording momentarily
Press START/STOP again.
"STBY" indicator appears in the viewfinder.

To finish recording
Turn STANDBY down and slide the POWER switch to OFF.

When you shoot a subject within 80 cm (31 1/2 inches) of the lens using telephoto zoom
If you cannot get a sharp focus while in extreme telephoto zoom, press the W side of the power zoom button until the focus is sharp.

Near the end of the tape

The ⊡ indicator, the red lamp in the viewfinder, and the camera recording/battery lamp on the camcorder flash slowly. When the tape reaches the end, the flashing becomes rapid.

To eject the tape

Make sure that the power source is connected.

1 Lift the lid at the indentation point.
2 Press EJECT.
3 Take out the cassette and press the area marked PUSH on the cassette compartment cover to close it.
4 Close the lid.

Caution!

Please remember that you can only use 8 mm format video cassettes with this camcorder, and that it is not possible to use PCM recording/playback function available on some 8 mm recorders. The PCM sound recorded or after-recoded with another recorder cannot be played back with this camcorder.
You can record tapes in SP (standard play) mode only, and play back tapes in both SP and LP (long play) modes.

If you wear glasses

You can bend back the eyecup to get a better view of the viewfider.

Notes on recording

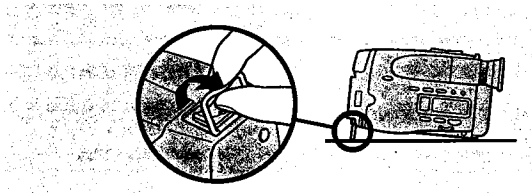
- When you record from the beginning of the tape, run the tape for about 15 seconds before the actual recording. This will ensure that you won't miss any start up scenes when the tape is played back.
- When moving from indoors to outdoors, or vice versa, turn STANDBY up and point the camcorder at a white object for about 15 seconds so that the white balance is properly adjusted.

If you leave the camcorder in standby mode for 5 minutes or more

The camcorder goes off automatically. To re-enter standby mode, turn the STANDBY switch down once and turn it up again. To start recording, press START/STOP directly.

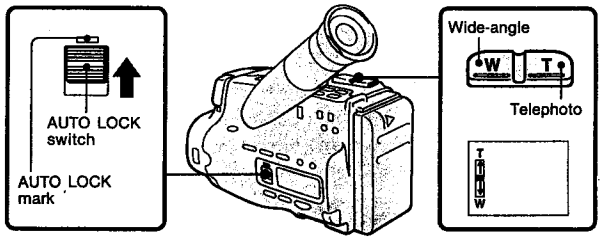
Note on an handy camcorder stand

Lift up the stand at the bottom of the camcorder.
Do not attach a shoulder strap through the stand.



Using the Zooming Feature

Zooming is a recording technique that lets you change the size of the subject in the scene. Use "Zoom-in (telephoto)" for dramatic close-ups, and "zoom-out (wide-angle)" for panoramic long shots. You can also use zooming to focus manually or to decide on a shooting angle. For more professional-looking recordings, use zooming sparingly.



Two-levels Speed Zooming

The camcorder's power zoom button offers two-levels speed zooming. Press it firmly for high speed zooming and softly, for relatively slow zooming.
Press the T side of the power zoom button for telephoto (subject appears closer) and the W side for wide-angle (subject appears farther away).

Autofocusing in Macro

Even small subjects such as flowers, insects, and images in photographs, can literally fill the screen using autofocus in macro.

1 Slide the AUTO LOCK switch up so that the AUTO LOCK mark (green) appears.
2 Bring the camcorder as close as necessary to obtain the desired subject size.
3 Press the W side of the power zoom button until the indicator in the viewfinder stops at the W end.

Manual focusing in Macro

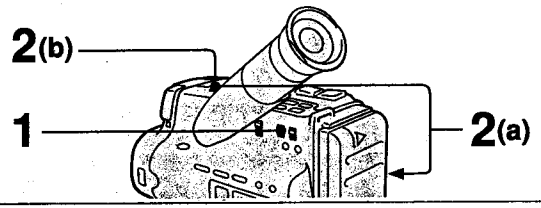
You can also shoot with manual focus while doing close-up.
For details of manual focusing, see page 33.

Note

You can shoot a subject that is at least 80 cm (about 31 1/2 inches) away from the lens surface in the telephoto position.

Using the Remote Commander

You can use the Remote Commander to record yourself with your friends or family, or conveniently control the playback of your tape from a distance. Before you use the Remote Commander, insert a supplied lithium battery into it (see page 6) and turn on the POWER switch.



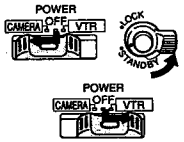
1 **Set the REMOTE COMMANDER ON/OFF switch on the camcorder to ON.**

The remote sensor pops up.

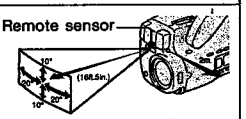
2 **Set the POWER switch on the camcorder as follows:**

(a) When recording, 1) while pressing the small green button on the POWER switch, slide it to CAMERA, 2) turn STANDBY up.

(b) When playing back, while pressing the small green button on the POWER switch, slide it to VTR.



3 **Aim the Remote Commander at the remote sensor on the camcorder and press the appropriate button on the Remote Commander.**



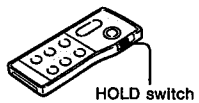
(Maximum distance and angle for remote control)

Note

The buttons that have the same name on the Remote Commander and on the camcorder functions equally.

To prevent misoperation

When you slide the HOLD switch in the direction of the arrow, none of the buttons on the Remote Commander will work. Use this to prevent any misoperation, such as accidentally pressing a button.

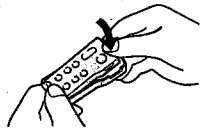


Notes on the Remote Commander operation

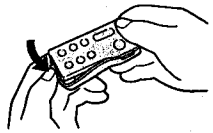
- Be sure that the Remote sensor is not in sunlight or strong light. In that case, you may not be able to operate with the Remote Commander.
- This camcorder works through the signals of the commander mode VTR 2. A commander mode is used to distinguish this camcorder from other Sony VCR to avoid misoperation. If you use another Sony VCR at commander mode VTR2, we recommend you change the commander mode or cover the remote sensor of the VCR with black paper.
- Be sure that there are no obstructions between the Remote Commander and the camcorder.

Using the Remote Commander holder

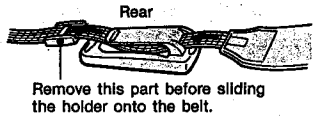
You can clip the Remote Commander holder on your coat pocket or belt, or slide it onto the shoulder belt before attaching the Remote Commander to it.



To remove the Remote Commander from the holder



To attach the holder to the shoulder belt



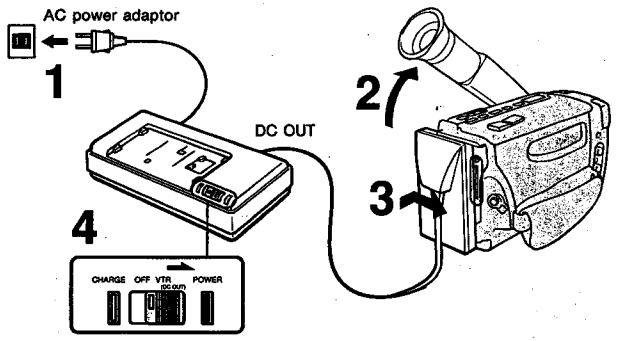
Using Alternative Power Sources

This section describes alternative power sources you can use for your camcorder: battery pack (see page 8), house current, and 12/24 V car battery.
Choose the appropriate power source depending on where you want to use your camcorder.

Place	Power source	Accessory to be used
Indoors	House current	AC power adaptor AC-V35 or AC-V35A (supplied), AC-S10, AC-V55
Outdoors	Battery pack	Battery pack NP-55 (supplied), NP-77HD, NP-77H, NP-77, NP-66H, NP-55H
In the car	12 V or 24 V car battery	DC pack DCP-77

Using House Current

To use the supplied AC-V35 or AC-V35A AC power adaptor:

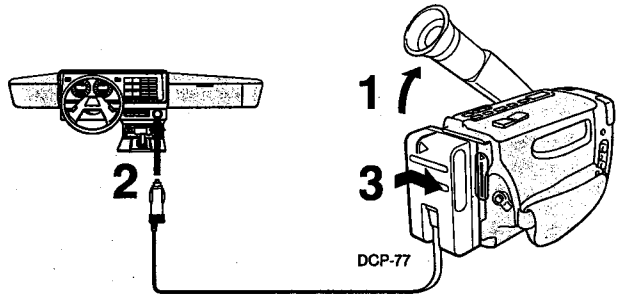


1 Connect the AC power adaptor to a wall outlet.
2 Lift up the viewfinder.
3 Align the right side of the connecting plate with the white line on the camcorder, and slide it to the right.
4 Set the selector to "VTR (DC OUT)" position.

To remove the connecting plate
The connecting plate is removed in the same way as the battery pack. See page 9.

Using a Car Battery

To use the DCP-77 DC pack (not supplied):



1 Lift up the viewfinder.
2 Connect the cord of the DC pack to the cigarette lighter socket of the car (12 V or 24 V).
3 Align the right side of the DC pack with the white line on the camcorder, and slide it to the right..

To remove the DC pack
The connecting plate is removed in the same way as the battery pack. See page 9.

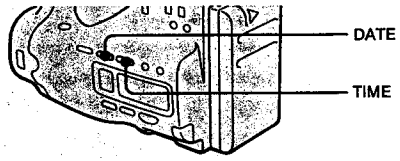
Options for Charging

- AC-S10 AC power adaptor:
  You can charge a battery pack whether it is used up or not with this adaptor because it has discharging function.
- BC-55, BC-77 or BC-S10 portable battery charger (ideal for travel):
  You can charge a battery pack on 100 – 240 V AC current.
- DC-V30 car battery charger:
  You can charge a battery pack through the cigarette lighter socket.

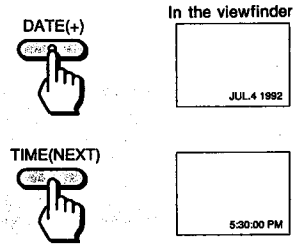
Camera Recording

In the "Chapter 2 Basic Operation", you learned the basic recording operations. This section shows you how to record the date or time, re-record a picture, prevent accidental erasure, and more.

Recording the Date or Time



While you are recording or when the camcorder is in recording standby, press DATE for the date indicator or TIME for the time indicator. The date or time displayed in the viewfinder is recorded with the picture.

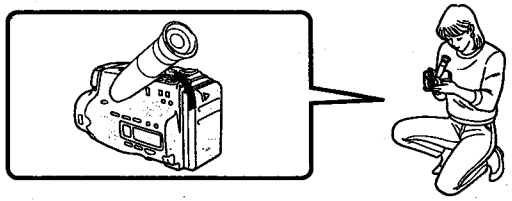


To stop recording with the date and time

Press DATE or TIME again. The date or time indicator disappears. The picture recording continues.

Recording in a Low-position

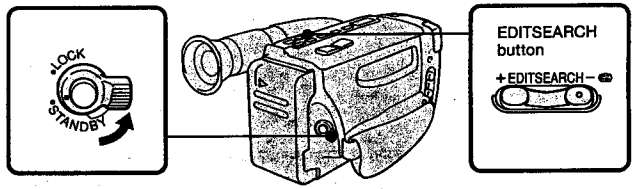
You can also record in a low position to get an interesting recording angle.
When the viewfinder is pushed down, you can monitor the picture without being close to the viewfinder.



Adjust the viewfinder barrel. (You can rotate it up to 90 degrees.)

Checking the Recorded Picture In the Viewfinder (EDITSEARCH)

Using EDITSEARCH, you can review the last recorded scene or check the recorded picture in the viewfinder.
After checking your recorded picture, you can also re-record over a previously recorded portion.



Reviewing the last recorded scene—Rec Review

You can check the last portion of a scene you just recorded in CAMERA mode. This is convenient for quick, on-the-spot checks.

1 Set the camcorder in standby mode by turning STANDBY up.
2 Press the – (⊖) side of EDITSEARCH momentarily.

The last few seconds of the recorded portion are played back in the viewfinder. Then the camcorder goes back to standby mode, ready for the next recording.

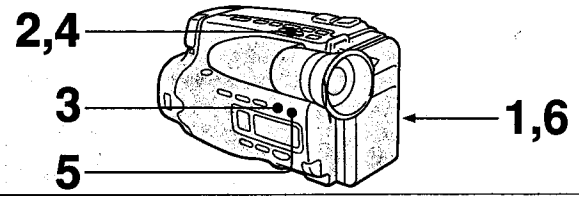
Checking your recorded picture

You can check the recorded picture in the viewfinder. After checking, you can also re-record over previously recorded portion.

1 Set the camcorder in standby mode by turning STANDBY up.
2 Keep pressing the + side or – side of EDITSEARCH to play back the picture while looking in the viewfinder.
+ side: to view the forward playback picture
– side: to view the reverse playback picture
To stop playback, release EDITSEARCH.
3 To re-record over a recorded portion:
❶ Press the + side or – side of EDITSEARCH to locate the point you want to begin re-recording.
❷ Press START/STOP to begin re-recording.
Re-recording begins from the point you released EDITSEARCH. As long as you do not eject the tape, the transition between the scenes will be smooth.

Inserting a Scene in the Middle of a Recorded Tape (Insert Recording)

You can insert a scene in the middle of a recorded tape by setting the starting and ending point. The previously recorded portion will be erased.

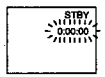


1 **Set the camcorder in standby mode by turning STANDBY up.**

2 **While looking in the viewfinder, keep pressing the + (forward playback) or −(reverse playback) side of EDITSEARCH, and release the button where you want to end the insertion.**
The camcorder enters standby mode again.

3 **Press COUNTER RESET.**

The counter resets to zero.
This works as an end point mark.

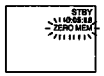


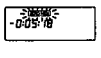
In the viewfinder

4 **While looking in the viewfinder, keep pressing the − side of EDITSEARCH and release the button at the point where you want to start the insertion.**

5 **Press ZERO MEM.**

The insert ending point is stored in memory.





In the display window

6 **Press START/STOP.**

Insert recording begins. The insert recording stops automatically at the counter zero point.

To cancel ZERO MEM

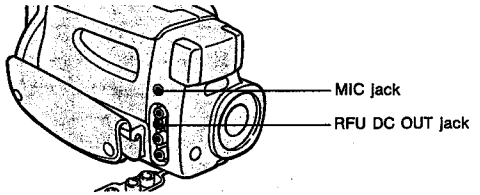
Press ZERO MEM.

Note

The picture may be slightly distorted at the ending point when played back.

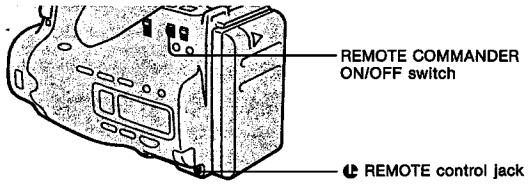
Recording with an External Microphone

You can connect an optional external microphone (stereo or monaural) to the MIC jack. This jack also accepts a "plug-in-power" microphone.



Connecting a Wired Remote Control Unit

When you connect an optional wired remote control unit or editing controller (not supplied) to the ⏾ REMOTE control jack on the camcorder, you can operate your camcorder from a distance. In this case, be sure to set the REMOTE COMMANDER ON/OFF switch of the camcorder to OFF.

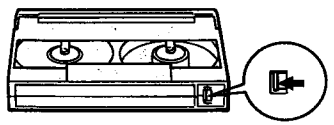


About ⏾ (LANC)

⏾ stands for Local Application Control Bus System. The ⏾ control jack is used for controlling the tape transport of video equipment and peripherals connected to it. This jack has the same function as the connectors indicated as CONTROL L or REMOTE.

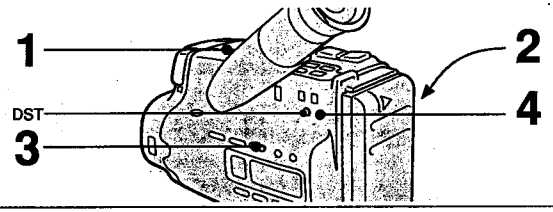
Preventing Accidental Erasure

To prevent accidental erasure, slide the tab on the cassette to expose the red mark. If you try to record with the red mark exposed, the ⌧ and ⏏ indicators flash in the viewfinder and in the display window, and you cannot record. To re-record on this tape, slide the tab back out covering the red mark.



Using the World Clock

You can reset the clock according to your time zone by pressing the AREA button.
Before using the world clock, set the date and time (see page 10).

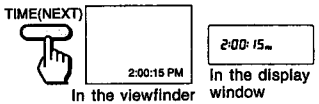


1 **While pressing the small green button on the POWER switch, slide it to CAMERA.**

2 **Turn STANDBY up.**

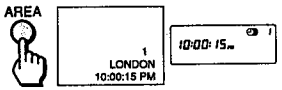
3 **Press TIME.**

The "date and time settings" appear.



4 **Press AREA until your time zone's name and number appear.**

The ⏲ indicator appears in the display window. You can find the area name and the number in the "Time zone chart" on the next page.

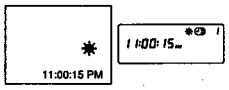


To check the date

Press DATE (+).
To turn off the date indicator, press DATE (+) again.

To adjust to daylight savings time

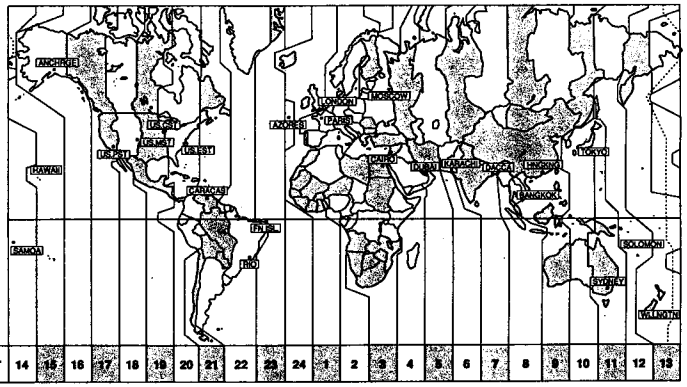
Press DST.
The time changes to daylight savings time.
To reset to standard time, press DST again.



To re-set to your home area time again

Press AREA until your home area name appears.

Time zone chart

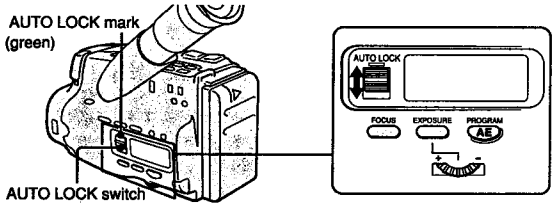


Area number	Area name	Nations or area*
1	LONDON	England, GMT (Greenwich Mean Time), Portugal
2	PARIS	Austria, France, Germany, Italy, Netherlands, Spain, Sweden, Switzerland
3	CAIRO	Egypt, Greece, Turkey
4	MOSCOW	Iraq, Kenya, Saudi Arabia, former Soviet Union (west)
5	DUBAI	United Arab Emirates
6	KARACHI	Moldives, Pakistan
7	DACCA	Bangladesh, India, Myanmar
8	BANGKOK	Cambodia, Indonesia (Jakarta), Thailand, Vietnam
9	HNGKNG	Australia (west), China, Hong Kong, Indonesia (Bali, Borneo), Malaysia, Philippines, Singapore, Taiwan
10	TOKYO	Japan, Korea
11	SYDNEY	Australia (east), Guam, Saipan
12	SOLOMON	New Caledonia
13	WLLNGTN	Fiji, New Zealand
14	SAMOA	Western Samoa
15	HAWAII	HST (Hawaii standard time), Tahiti
16	ANCHRGE	AST (Alaska standard time)
17	US. PST	PST (Pacific standard time)
18	US. MST	MST (Mountain standard time)
19	US. CST	CST (Central standard time), Mexico
20	US. EST	EST (East standard time), Peru
21	CARACAS	Chile, Venezuela
22	RIO	Argentina, Brazil
23	FN ISL.	Fernando de Noronha
24	AZORES	Azores Islands

* These are common names. They may be different from formal country names.

Selecting Automatic/Manual Adjustment Mode

You can set your camcorder to operate in either manual and automatic mode. The camcorder's automatic function offers you worry-free operation under most shooting conditions. But in some circumstances, manual adjustment is better for creative recording.



Setting the camcorder for automatic mode

To set the camcorder to automatic mode, slide the AUTO LOCK switch up so that the AUTO LOCK mark (green) appears. When the camcorder is in automatic mode, the focus and exposure are controlled automatically.

Setting the camcorder for manual mode

To set the camcorder to manual mode, slide down the AUTO LOCK switch.
While the camera is in manual mode, you can:

- Adjust the focus
- Adjust the exposure
- Select from three PROGRAM AE (auto exposure) modes: Portrait mode, Sports mode, and High-Speed Shutter mode

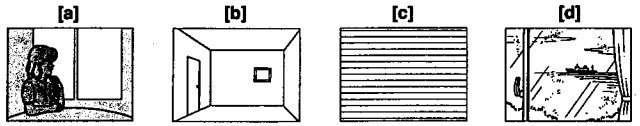
Even if you slide the AUTO LOCK switch down (in manual adjustment mode)

The settings you didn't adjust manually remain the same as those in automatic adjustment.

Focusing Manually

When to use manual focus

In the following cases you should obtain better results by adjusting the focus manually.

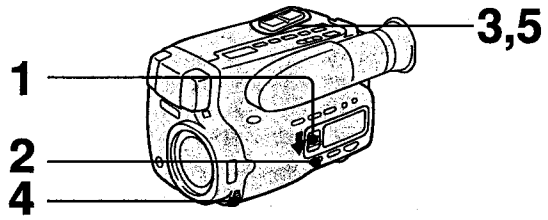


[a] to **[b]** correspond to the illustrations above.

- Too much brightness behind the subject **[a]**
- Subjects with little contrast – walls, sky, etc. **[b]**
- Horizontal stripes **[c]**
- Subject through frosted glass **[d]**
- Insufficient light
- One subject is close; the other is in the center, but at a distance
- Subjects beyond nets, etc., or another subject passes in front of the camcorder
- Bright subject or subject reflecting light
- High contrast behind the subject (the background may be focused)
- When using conversion lenses or effect filters
- When shooting a stationary subject using tripod
- When you want to save battery power

Focusing Manually

When adjusting the focus manually, the best way is to first adjust at telephoto position before recording, then set the desired zoom angle.

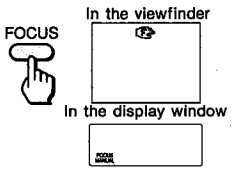


1 **Slide the AUTO LOCK switch down.**

The AUTO LOCK mark (green) disappears.

2 **Press FOCUS.**

The ☞ (manual focusing) indicator appears in the viewfinder and the FOCUS MANUAL indicator appears in the display window.



3 **Keep pressing the T (telephoto) side of the power zoom button until the zooming stops.**

4 **Turn the focus dial to achieve sharp focus.**

The focus dial does not have a stop position.

5 **Set the desired shot length using the power zoom button.**

To reactivate autofocusing

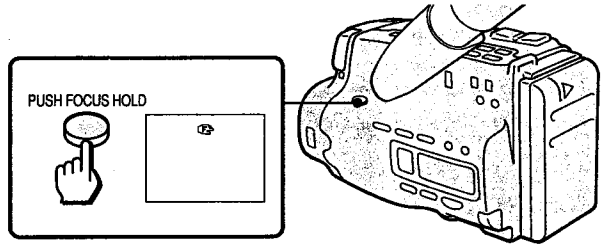
Press FOCUS until the ☞ indicator in the viewfinder disappears.

Shooting in relatively dark places

When shooting in relatively dark places such as indoors, the depth of field (distance range of the subject that will be in sharp focus) is very shallow. For best results, shoot at wide angle after focusing in the telephoto position.

Fixing the Focus to the Object

With this camcorder, the focus is adjusted automatically as long as the AUTO LOCK switch is slid up. However, depending on the circumstances, the object you want to shoot may not always be in focus. (e.g. Another object abruptly passes in front of the camcorder, etc.) When you want to keep the object in focus, hold down PUSH FOCUS HOLD.
You can use this function both in automatic and manual adjustment mode.



1 **Focus on the object you want to shoot.**

2 **Keep pressing PUSH FOCUS HOLD.**

The ☞ indicator appears in the viewfinder.
The automatic focus is inactivated and the focus is fixed to the object you want to focus.
While pressing PUSH FOCUS HOLD, you can also adjust the focus manually by turning the FOCUS MANUAL dial.

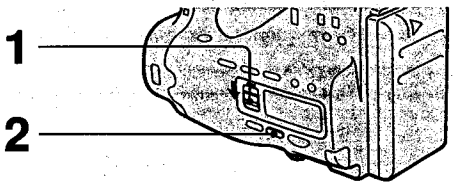
Adjusting the Exposure

When you adjust the exposure

In the following cases you would obtain better results by adjusting the exposure manually.

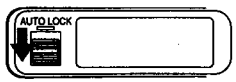
Condition:	Turn the EXPOSURE dial in the direction of the arrow
The background is too bright (backlighting)	
Insufficient light: most of the picture is dark.	
Bright subject and dark background	
To record the darkness faithfully	

Adjusting the Exposure



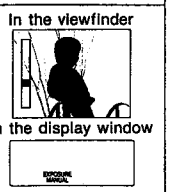
1 **Slide the AUTO LOCK switch down.**

The AUTO LOCK mark (green) disappears.



2 **Press EXPOSURE.**

The exposure indicator appears in the viewfinder and EXPOSURE MANUAL indicator appears in the display window.



3 **Adjust the exposure by turning the EXPOSURE dial.**

The exposure is locked at the adjusted brightness.

To return to the automatic exposure mode

Press EXPOSURE so that the exposure indicator in the viewfinder and the EXPOSURE MANUAL indicator in the display window disappears.

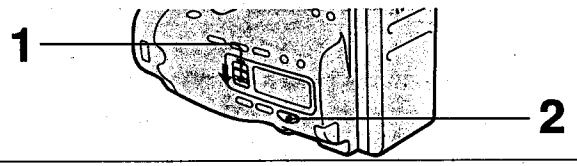
Using the PROGRAM AE Function

When you use the PROGRAM AE (Auto Exposure) function, you can give a "portrait" effect (the object is in focus and the background is out of focus) or capture high-speed action with "sports" mode or "high speed shutter" mode. Select from three types of mode referring to the following table.

To choose the best programmed AE mode

When shooting:	Select:
• A still subject such as a person or a flower • Zooming in a subject in the telephoto mode • A subject behind such obstacle as a net	(Portrait mode)
• Outdoor sports scene such as football, tennis or golf • A landscape in a moving car	(Sports mode)
• A golf swing or a tennis match with the tennis ball captured clearly • Playing back certain scenes with high speed movements in a clear, sharp picture	(High speed shutter mode)

Selecting the PROGRAM AE Mode



1 **Slide the AUTO LOCK switch down.**

The AUTO LOCK mark (green) disappears.

2 **Press PROGRAM AE repeatedly so that the desired PROGRAM AE mode indicator appears in the viewfinder and the display window.**
Each time you press the button, the indicator changes as follows:

(Portrait mode) → (Sports mode) → (High-speed shutter mode) → No indicator

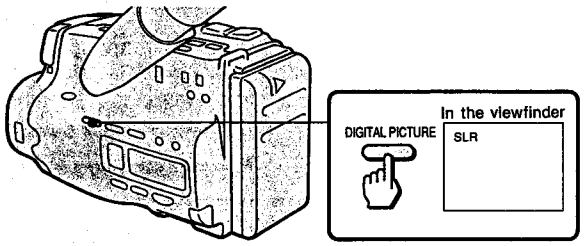
Notes

- As long as the PROGRAM AE indicators are displayed in the viewfinder and the display window, you can not adjust exposure manually. If you should press EXPOSURE when the PROGRAM AE indicator is displayed, the PROGRAM AE function is canceled and the exposure adjustment function starts to operate. To restore the PROGRAM AE function, press PROGRAM AE again.
- The shutter speed in each RPOGRAM AE mode is as follows:
  Portrait mode – between 1/60 to 1/1850
  Sports mode – between 1/60 to 1/500
  High-speed shutter mode – 1/4000

Using the Digital Picture Function

Using the digital picture function, you can record a picture with a solarization or mosaic effect. The solarization effect offers you the picture like an illustration with the contrast emphasized. You can also choose from two types of mosaic effect.

Selecting the Digital Picture

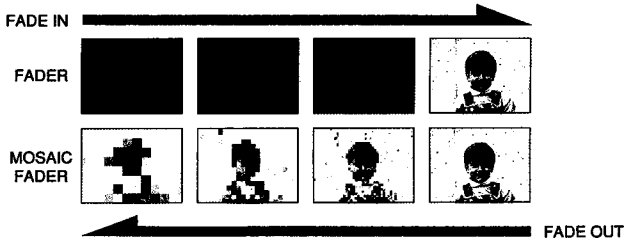


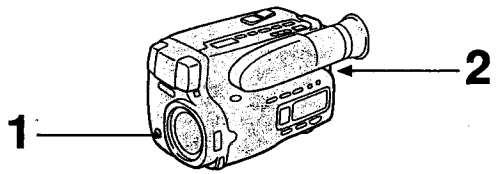
Press DIGITAL PICTURE repeatedly so that the desired digital picture indicator appears. Each time you press the button, the indicator changes as follows:

SLR (Solarization) → MSC (Mosaic) 1 → MSC (Mosaic) 2 → No indicator

Fade-in and Fade-out

You can fade a picture in or out with sound to give your recording a professional touch. When fading-in, you can make the picture gradually appear from black or mosaic while increasing the sound. When fading-out, you can make the picture gradually fade to black or mosaic while decreasing the sound.



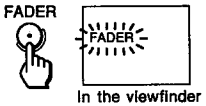


1 Select the type of fade by pressing FADER as follows:

(a) When fading-in, press it after turning the STANDBY switch up to put the camcorder into standby mode. The fade indicator starts flashing.
(b) When fading-out, press it while recording.
The fade indicator starts flashing.

Note on the FADER button
Each time you press FADER,
the indicator changes as follows:

FADER (black fade) → M. FADER (mosaic fade)
↑ No indicator ←



2 Press START/STOP.

When fading-in, the fade indicator stops flashing and the recording starts fading in.
When fading-out, the fade indicator stops flashing, the picture fades out, and then recording stops.

To cancel the fade-in/fade-out function
Before pressing START/STOP, press FADER so that the FADER indicator disappears.

Playing Back a Tape

Various Playback Modes

Still picture (playback pause)

To view a still picture, press ❚❚ during playback.
❚❚ appears in the viewfinder.
To resume normal playback, press ▷ or ❚❚.

Note

When still picture mode lasts for 5 minutes or more, the camcorder automatically stops.

High-speed search (picture search)

To monitor a picture in high speed and locate a desired scene quickly, keep pressing ◀◀ or ▶▶ during playback.
To resume normal playback, release the button.

High-speed search during fast forward or rewind (skip scan)

You can also go into high-speed search during fast foward or rewind to locate a desired scene more quickly. Press ◀◀ while rewinding or ▶▶ while advancing the tape.
To resume normal playback, press ▷.

Note on various playback modes

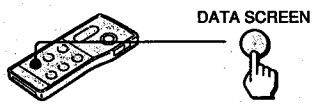
During various playback modes, streaks appear and the sound is muted.

In playback pause mode

You can view the pictuer in a sequence of stop-motoin images by pressing EDITSEARCH. If you keep pressing EDITSEARCH, you can view the picture playback in forward or reverse direction.

Displaying the viewfinder screen indicators on the TV

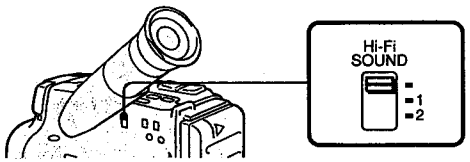
Press the DATA SCREEN button on the Remote Commander.
You can only use this function with the Remote Commander.



The indicator in the viewfinder screen is superimposed on the TV screen.
To clear the indicator, press the DATA SCREEN button again.

Selecting the monitor sound

You can select the playback sound with the HI-FI SOUND switch.



Normally, set this switch to the "Green position".

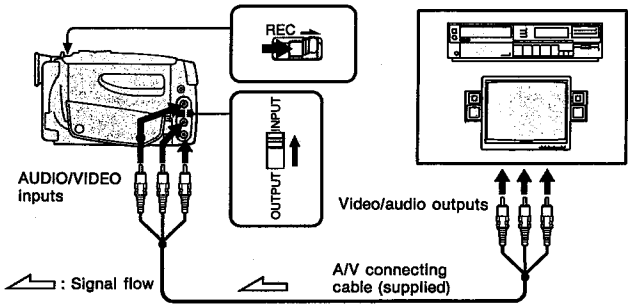
- When you playback a tape with monaural sound, same monaural sound will come out from both audio jacks with this switch set to the green position.
- Set the switch to "1"or "2" only when playing back a dual sound track tape such as a bilingual sound track tape.

Recording

Recording from a VCR or TV

You can record a tape from another VCR, or a TV program from the TV equipped with video/audio outputs.

Connection



- **Disconnect the RFU adaptor from the camcorder if it is connected.**
- **Make the connections using the supplied A/V connecting cable.**
- **If your TV is a monaural type, connect only the white plug for audio both on the camcorder and the TV or the VCR. Do not use the red plug. In this case, the sound will be in monaural.**

To record

1. **Make sure that the INPUT/OUTPUT switch is set to INPUT.**
2. **Set the POWER switch on the camcorder to VTR.**
3. **Insert the tape in the camcorder.**
4. **Turn on the VCR or TV.**
5. **Play back the tape (in another VCR) or select the TV channel to be recorded.**
6. **Slide the REC switch in the direction of the arrow.**
   Recording starts. You can monitor the picture recorded in the viewfinder.

Recording

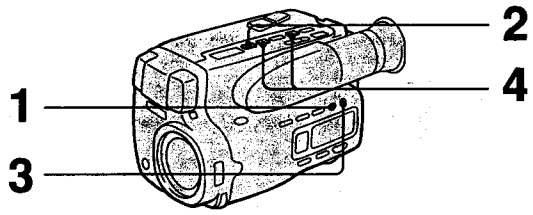
Using the Tape Counter

Tape counter tells you the actual recording or playback time.
You can also use tape counter to memorize a specific point on the tape.

To count the whole tape

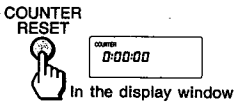
Press COUNTER RESET at the beginning of the tape so that the counter shows "0:00:00".

To return to a preset point



1 **During playback, press COUNTER RESET at the point you later want to close.**

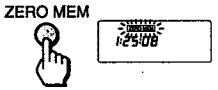
The counter shows "0:00:00".



2 **Press ☐ when playback has finished, as usual.**

3 **Press ZERO MEM.**
The "ZERO MEM" indicator flashes.

Note: The ZERO MEM does not function during recording or playback.



4 **Press ◀◀ or ▶▶.**

The tape rewinds or advances and stops automatically when the counter reaches approximately zero.

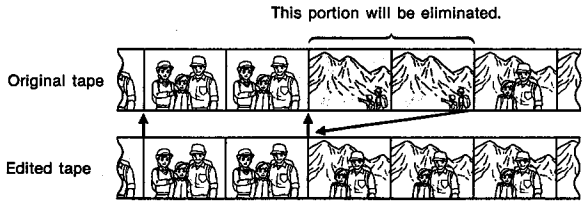
Note

The counter reading and the point on the tape may not correspond exactly. Use the counter as a guide. There will be a time lag of several seconds especially when you fast-forward or rewind repeatedly and play back a tape recorded in LP (long play) and SP (standard play) modes mixed.

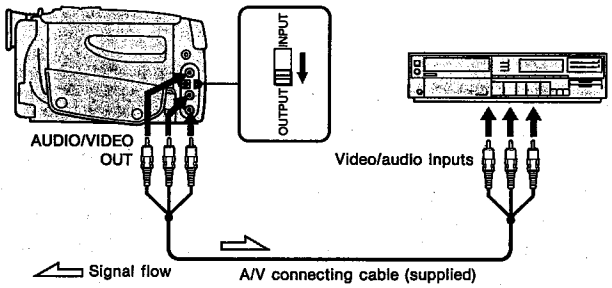
Editing

Editing Tapes with a VCR

You can create your own video program by editing with any other 8mm, Hi8, Betamax, ED Betamax, VHS, S-VHS, VHSC or S-VHSC VCR that has video/audio inputs.



Connection

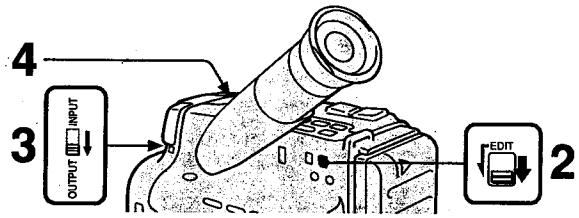


1 Connect the camcorder and the VCR using the supplied A/V connecting cable.

2 Set the input selector on the VCR to LINE, if available.

If your VCR is a monaural type, connect only the white plug for audio both on the camcorder and the VCR. Do not use the red plug. In this case, the sound will be in monaural.

How to edit



1 Insert a tape to be recorded into the recording VCR.
2 Slide EDIT on the camcorder in the direction of the arrow.
3 Set INPUT/OUTPUT to OUTPUT.
4 While pressing the small green button on the POWER switch, slide it to VTR.
5 Insert your recorded tape into the camcorder.
6 Play back the tape on the camcorder until you locate the point where you want to start editing, then set the camcorder to the playback pause mode.
7 On the recording VCR, locate the recording start point and set the VCR to the recording pause mode.
8 Press II PAUSE on the camcorder and VCR simultaneously to start editing.

To edit more scenes
Repeat steps 6 to 8.

To stop editing momentarily
Press II on the recording VCR.

To stop editing
Press □ on both the camcorder and the VCR.

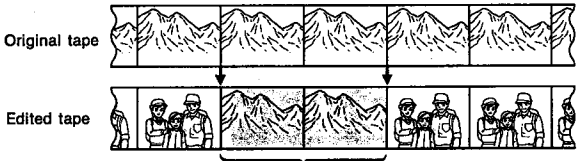
Use of the EDITSEARCH button
You can play back the tape in normal/reverse direction by keep pressing EDITSEARCH during recording pause or playback pause. You can also play back still pictures successively at specific intervals by pressing EDITSEARCH intermittently.

Use of the EDIT switch
When you slide EDIT in the direction of the arrow (EDIT ON), you can keep picture and deteriorations resulting from editing to a minimum. However, when you edit or copy to another VCR, avoid using the edited tape for multiple generations of editing.
After editing, be sure to set this switch in the opposite direction of the arrow (EDIT OFF).

Note on DATA SCREEN function
If you have displayed the viewfinder screen indicators on the TV (DATA SCREEN function), erase the indicators by pressing DATA SCREEN on the remote commander so that they will not superimposed on the edited tape.

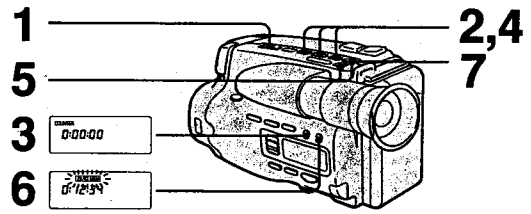
Replacing Recording on a Tape (Insert Editing)

You can insert a new scene from a VCR onto your originally recorded tape by specifying starting and ending points.



Connection
Connections are the same as in "Recording from a VCR or TV (page 43)". Before you begin replacing recordings, **set the VCR to the playback pause mode at the beginning of the scene to be recorded.**

To replace recordings

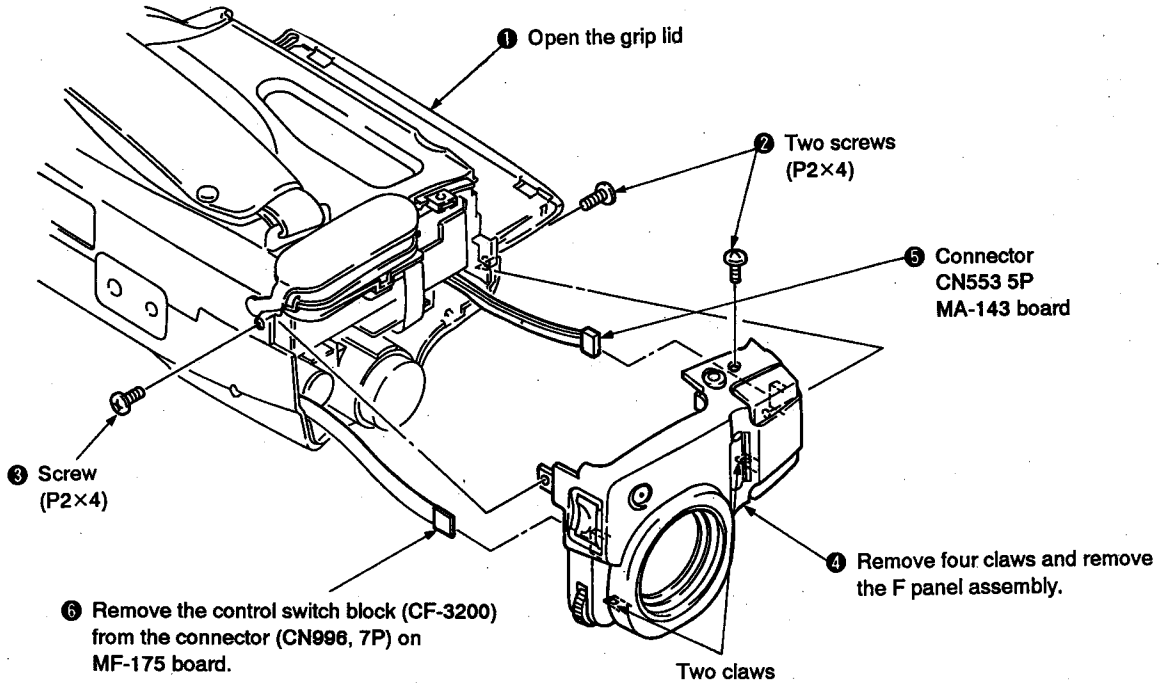


1 While pressing the small green button on the POWER switch, slide it to VTR.
The counter appears in the display window.
2 After pressing ▷, press ◀◀ or ▶▶ to locate the end point where the insert should end.
The viewfinder screen shows a high-speed playback picture.
3 Press COUNTER RESET at the end point.
The counter resets to "0:00:00".
4 Locate the start point where the insert should begin by pressing ◀◀.
5 After pressing II, slide the REC switch in the direction of the arrow at the start point.
6 Press ZERO MEM.
The end point of the insert is stored in memory.
ZERO MEM indicator flashes in the display window.
7 Press II on both the camcorder and the VCR to start insert editing.
You can monitor the picture being inserted in the viewfinder.
The insert recording stops automatically near the zero point on the counter.

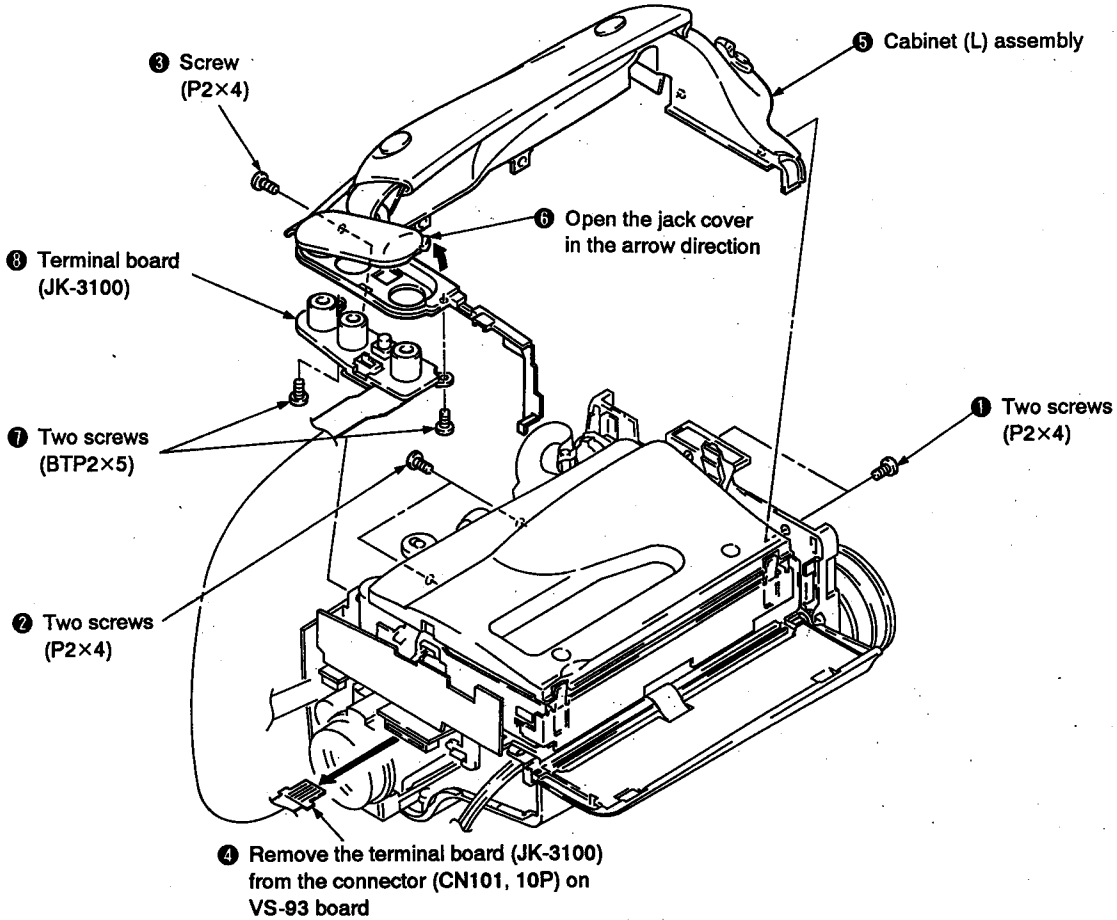
To change the end point
Press ZERO MEM so that the ZERO MEM indicator disappears, and begin from step 2.

SECTION 2
DISASSEMBLY

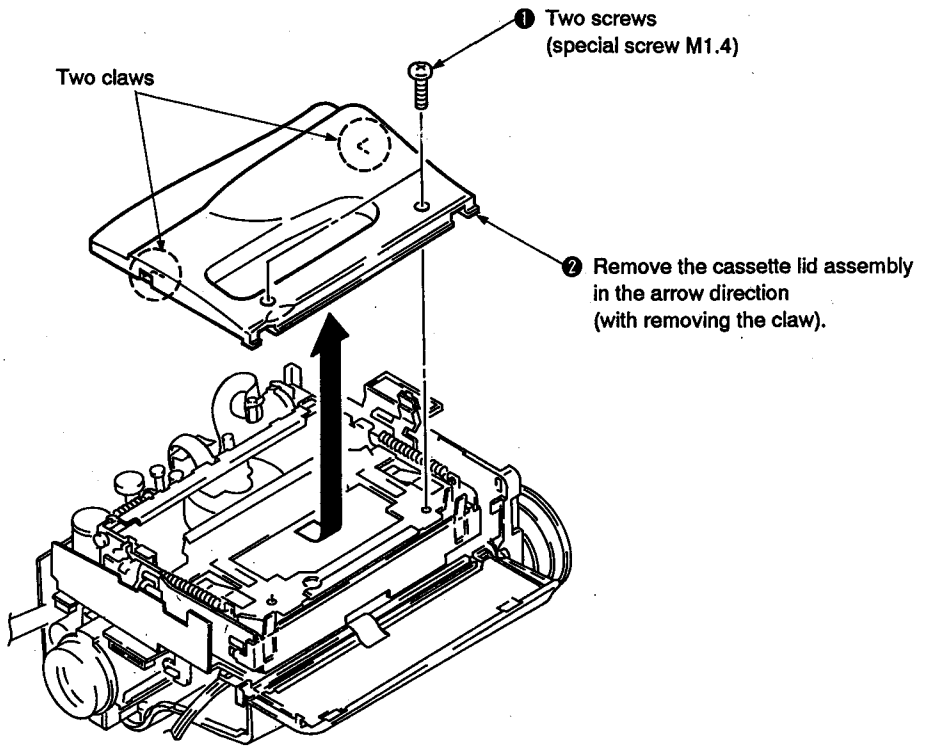
2-1. REMOVAL OF F PANEL ASSEMBLY


❶ Open the grip lid
❷ Two screws (P2×4)
❺ Connector CN553 5P MA-143 board
❸ Screw (P2×4)
❹ Remove four claws and remove the F panel assembly.
❻ Remove the control switch block (CF-3200) from the connector (CN996, 7P) on MF-175 board.
Two claws

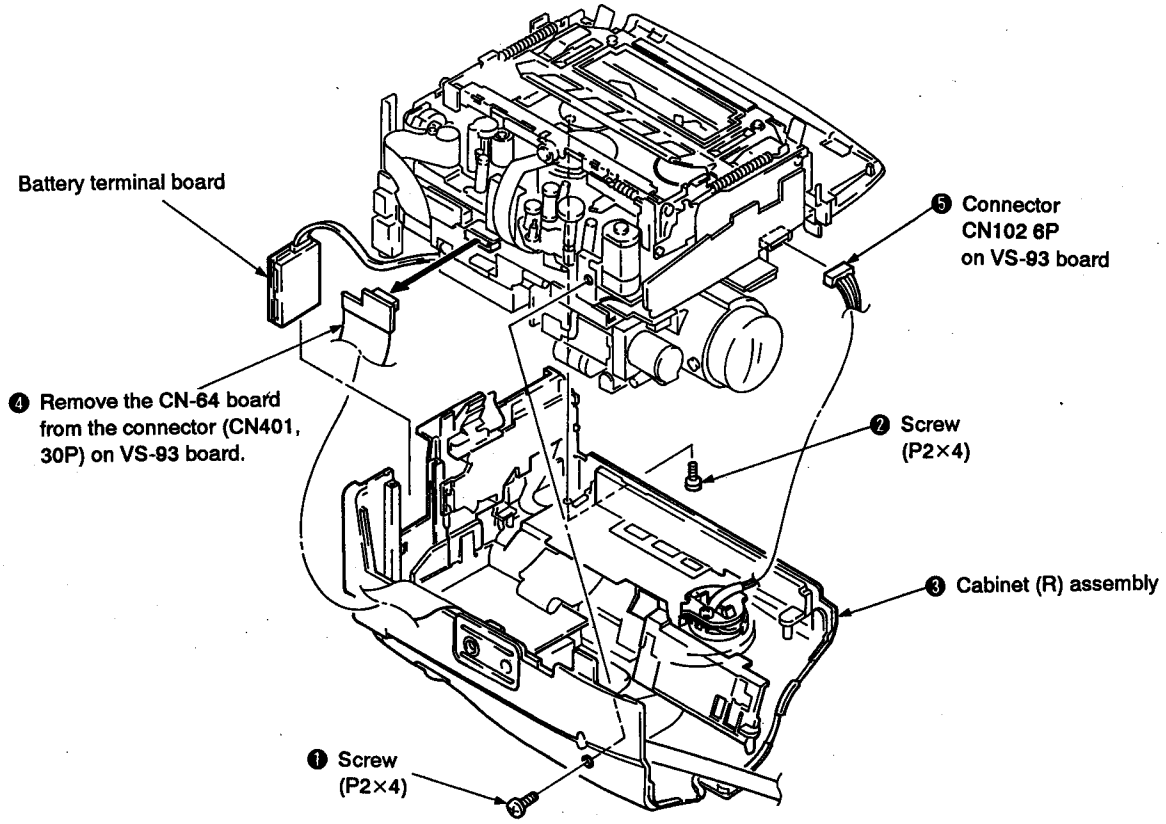
2-2. REMOVAL OF CABINET (L) ASSEMBLY AND TERMINAL BOARD (JK-3100)


❸ Screw (P2×4)
❺ Cabinet (L) assembly
❻ Open the jack cover in the arrow direction
❽ Terminal board (JK-3100)
❶ Two screws (P2×4)
❼ Two screws (BTP2×5)
❷ Two screws (P2×4)
❹ Remove the terminal board (JK-3100) from the connector (CN101, 10P) on VS-93 board

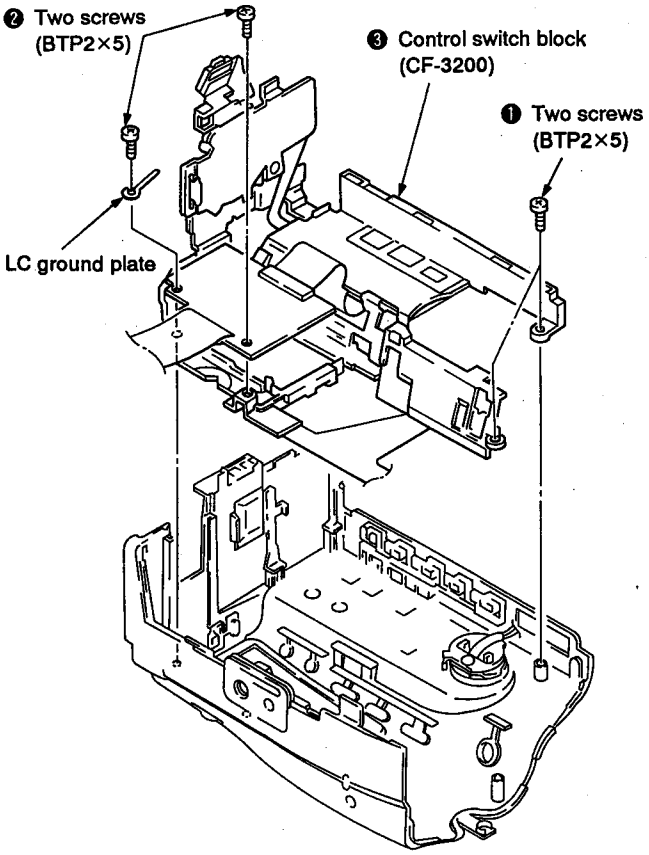
2-3. REMOVAL OF CASSETTE LID ASSEMBLY



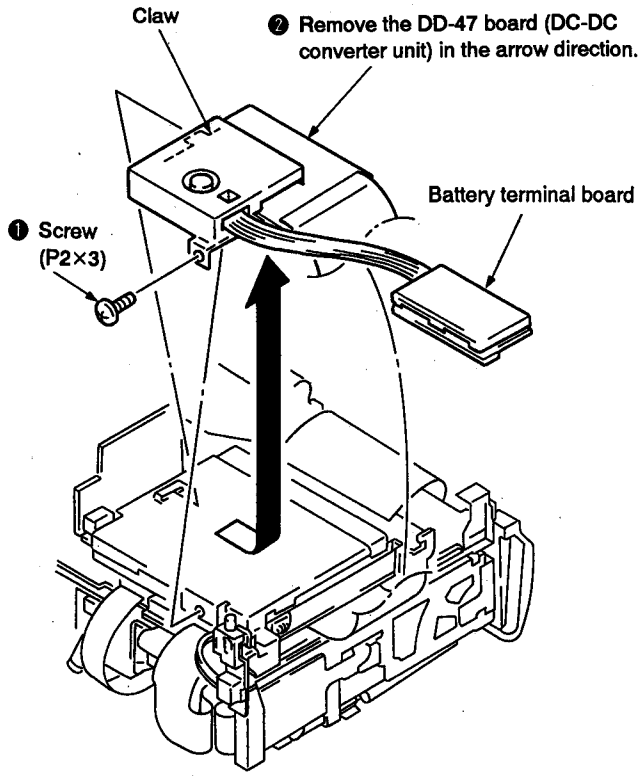
2-4. REMOVAL OF CABINET (R) ASSEMBLY



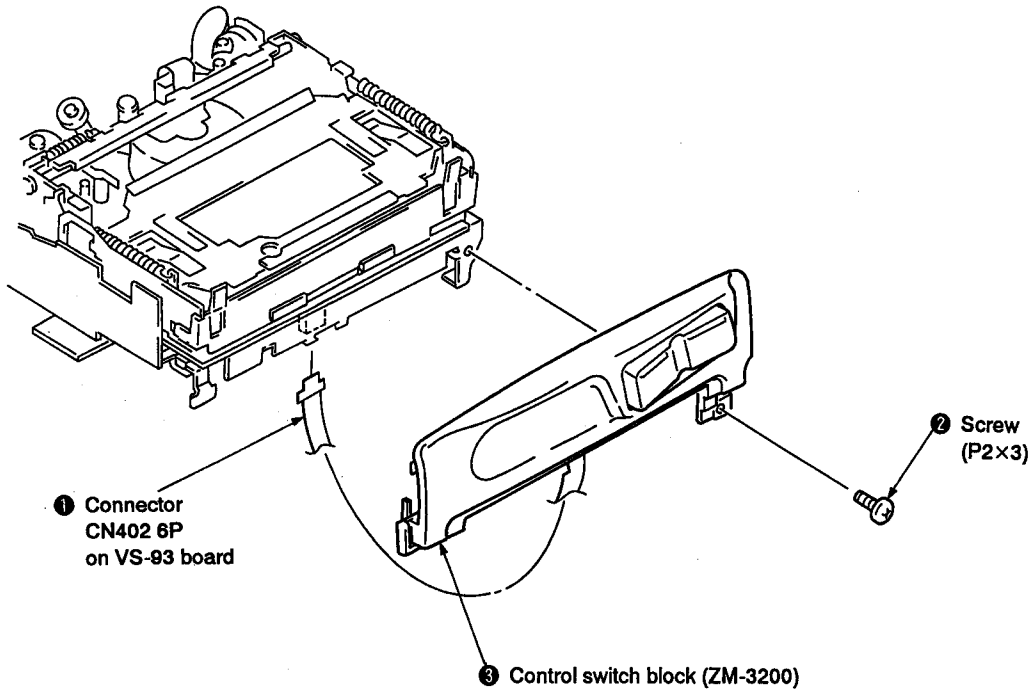
2-5. REMOVAL OF CONTROL SWITCH BLOCK (CF-3200)



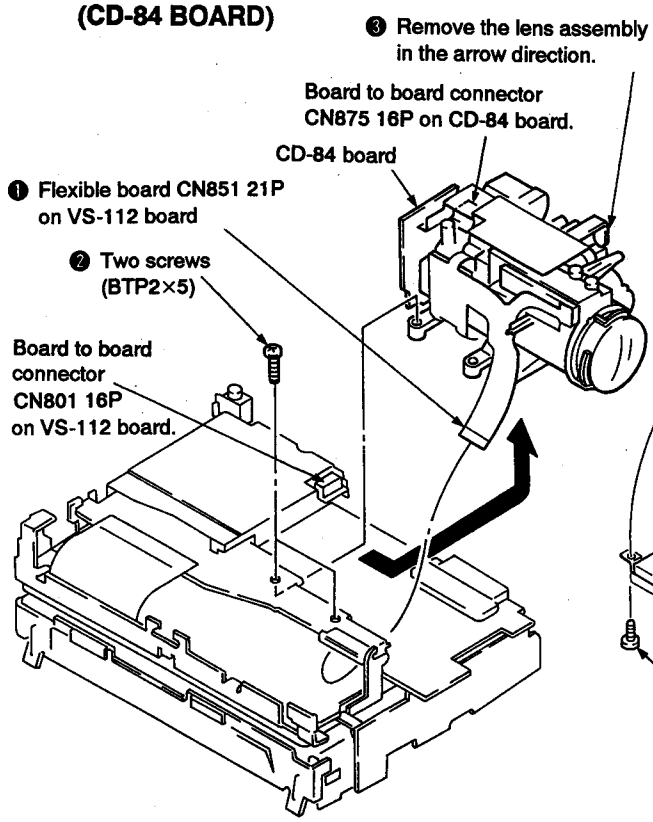
2-6. REMOVAL OF DD-47 BOARD (DC-DC CONVERTER UNIT)



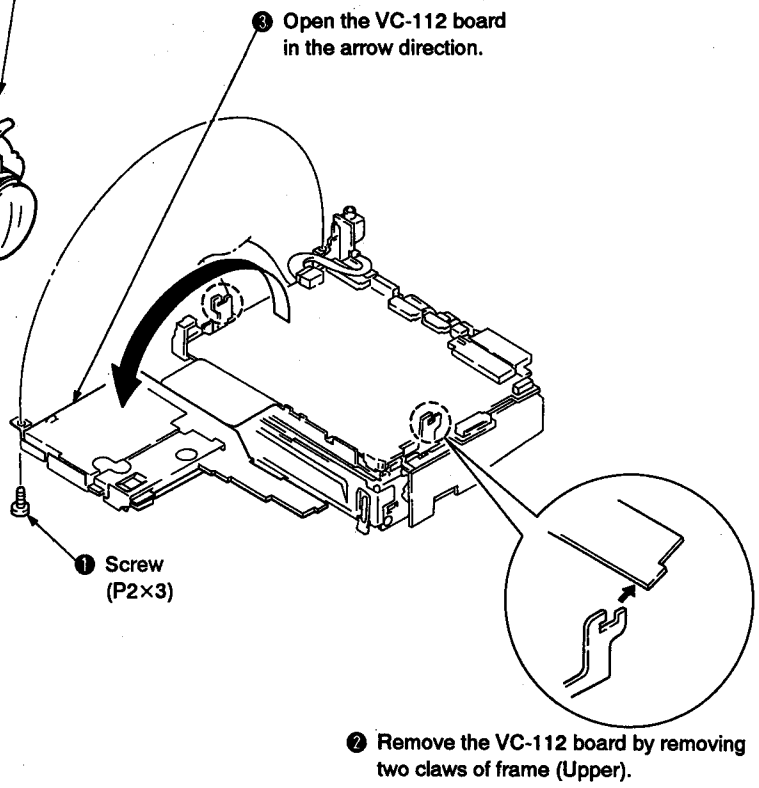
2-7. REMOVAL OF CONTROL SWITCH BLOCK (ZM-3200)



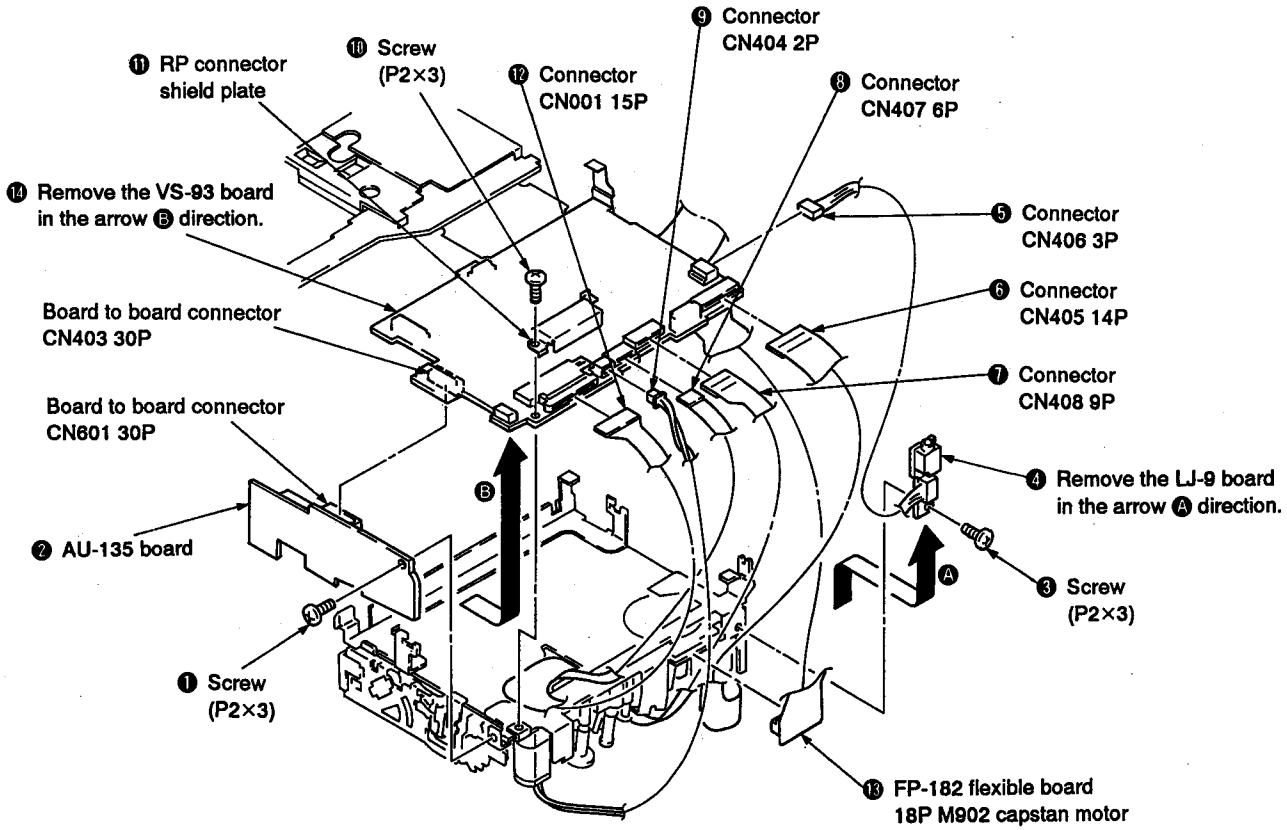
2-8. REMOVAL OF LENS ASSEMBLY (CD-84 BOARD)


❸ Remove the lens assembly in the arrow direction.
Board to board connector CN875 16P on CD-84 board.
CD-84 board
❶ Flexible board CN851 21P on VS-112 board
❷ Two screws (BTP2×5)
Board to board connector CN801 16P on VS-112 board.

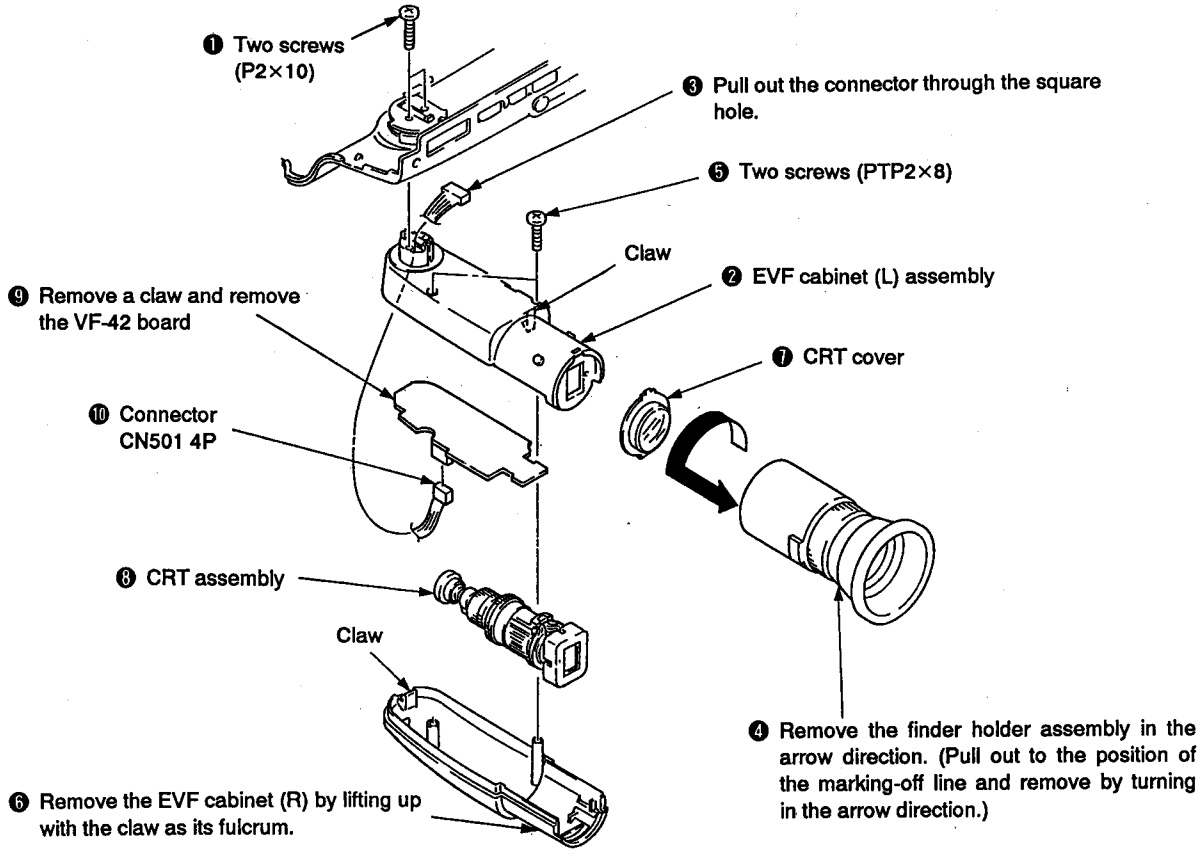
2-9. OPENING OF VC-112 BOARD



2-10. REMOVAL OF VS-93 BOARD


❾ Connector CN404 2P
❿ Screw (P2×3)
⓫ RP connector shield plate
⓬ Connector CN001 15P
❽ Connector CN407 6P
⓮ Remove the VS-93 board in the arrow Ⓑ direction.
❺ Connector CN406 3P
❻ Connector CN405 14P
Board to board connector CN403 30P
❼ Connector CN408 9P
Board to board connector CN601 30P
❹ Remove the LJ-9 board in the arrow Ⓐ direction.
❷ AU-135 board
❸ Screw (P2×3)
❶ Screw (P2×3)
⓭ FP-182 flexible board 18P M902 capstan motor

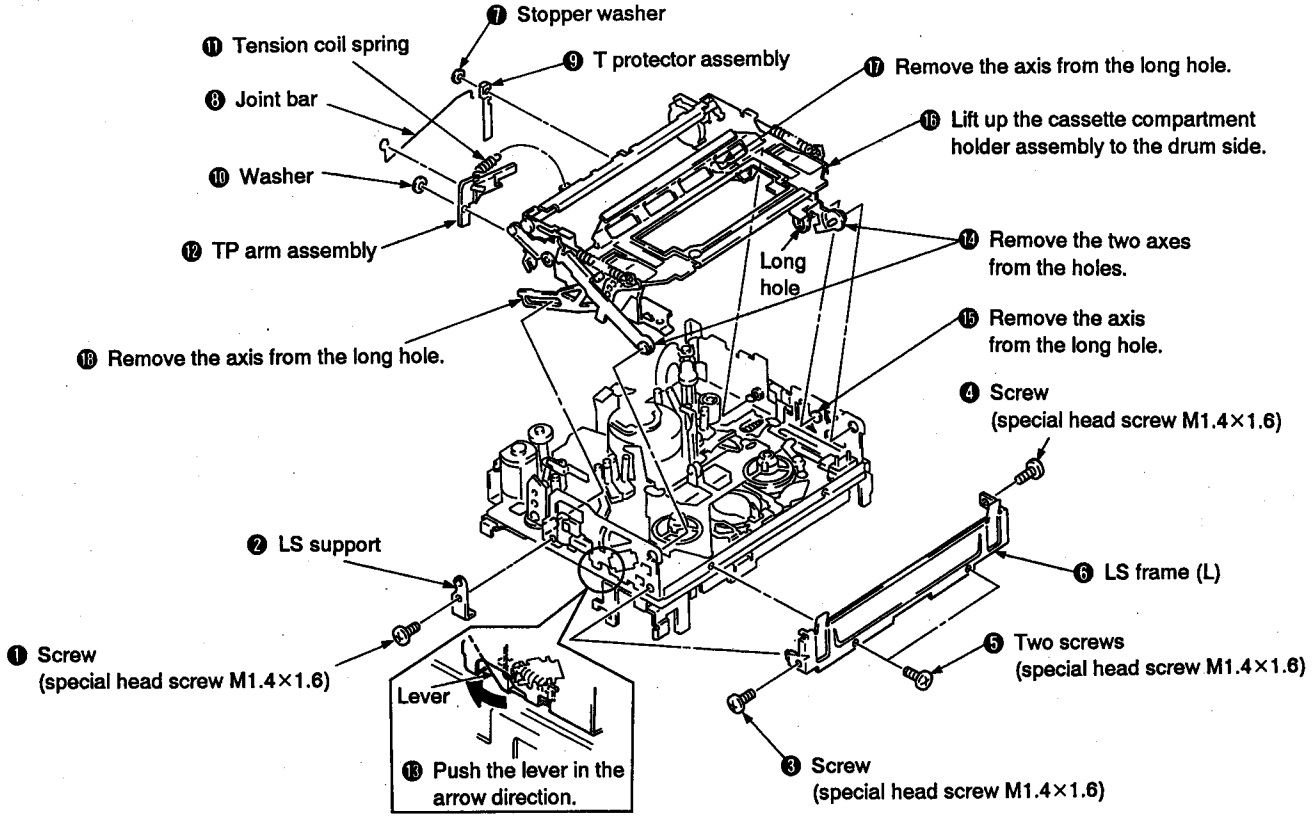
2-11. REMOVAL OF EVF ASSEMBLY (VF-42 BOARD)


❶ Two screws (P2×10)
❸ Pull out the connector through the square hole.
❺ Two screws (PTP2×8)
Claw
❷ EVF cabinet (L) assembly
❾ Remove a claw and remove the VF-42 board
❼ CRT cover
❿ Connector CN501 4P
❽ CRT assembly
Claw
❹ Remove the finder holder assembly in the arrow direction. (Pull out to the position of the marking-off line and remove by turning in the arrow direction.)
❻ Remove the EVF cabinet (R) by lifting up with the claw as its fulcrum.

2-12. REMOVAL OF CASSETTE COMPARTMENT HOLDER ASSEMBLY

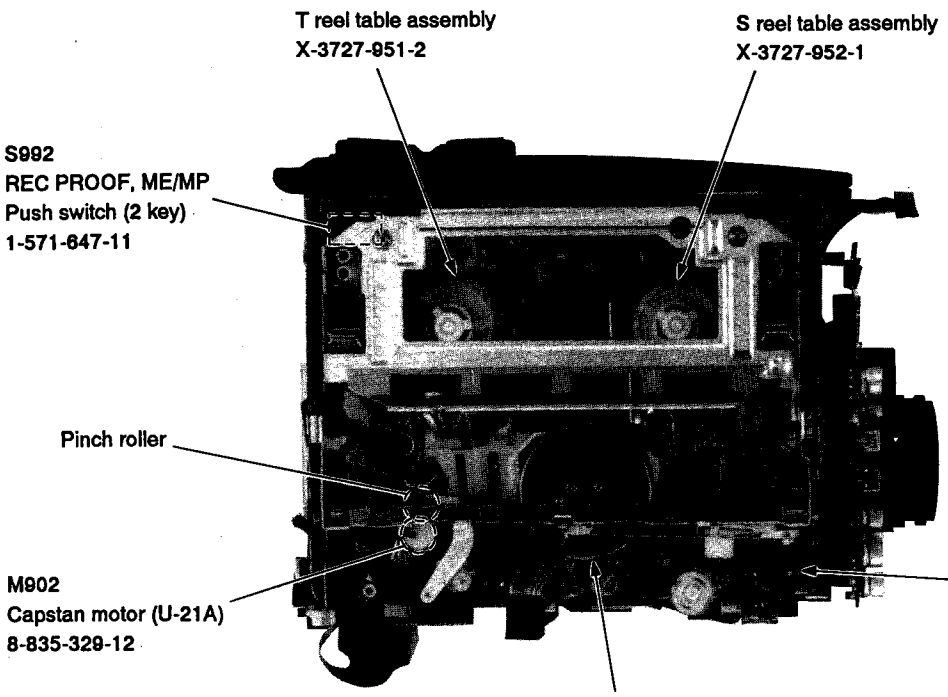
In the beginning, set to [USE] mode.

(When setting to [USE] mode, see "2-4. Handing of Mode Selector" in "8 mm video mechanical adjustment manual II [FL Mechanism (Q mechanism)].)


❼ Stopper washer
⓫ Tension coil spring
❾ T protector assembly
⓱ Remove the axis from the long hole.
❽ Joint bar
⓰ Lift up the cassette compartment holder assembly to the drum side.
❿ Washer
⓬ TP arm assembly
⓮ Remove the two axes from the holes.
Long hole
⓯ Remove the axis from the long hole.
⓲ Remove the axis from the long hole.
❹ Screw (special head screw M1.4×1.6)
❷ LS support
❻ LS frame (L)
❶ Screw (special head screw M1.4×1.6)
❺ Two screws (special head screw M1.4×1.6)
Lever
⓭ Push the lever in the arrow direction.
❸ Screw (special head screw M1.4×1.6)

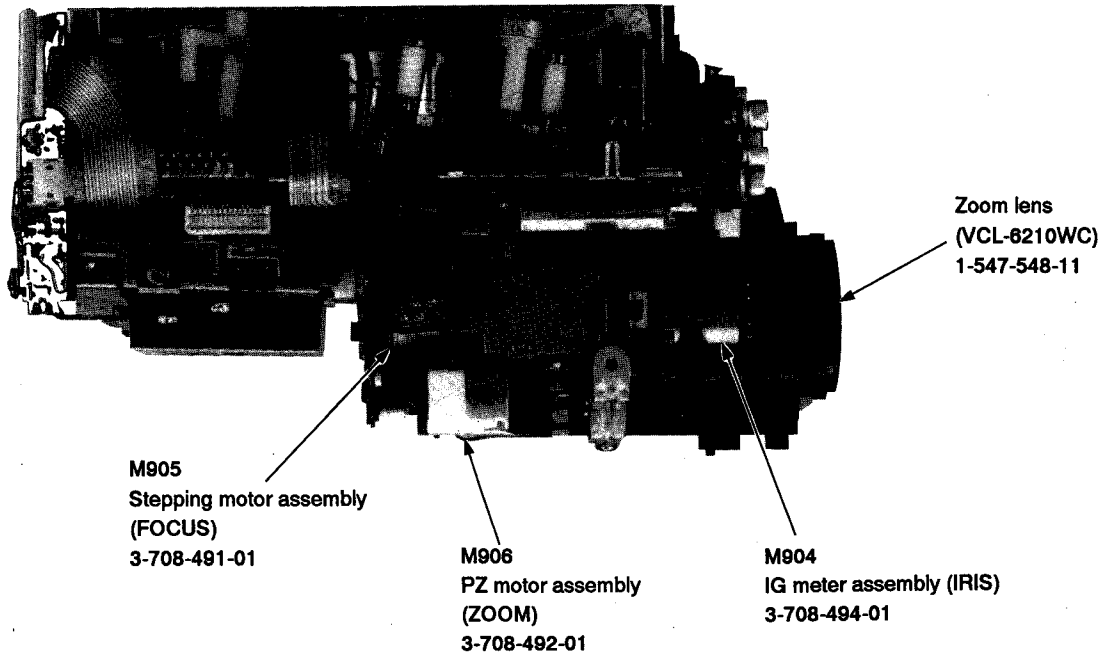
2-13. INTERNAL VIEWS

— Left side —



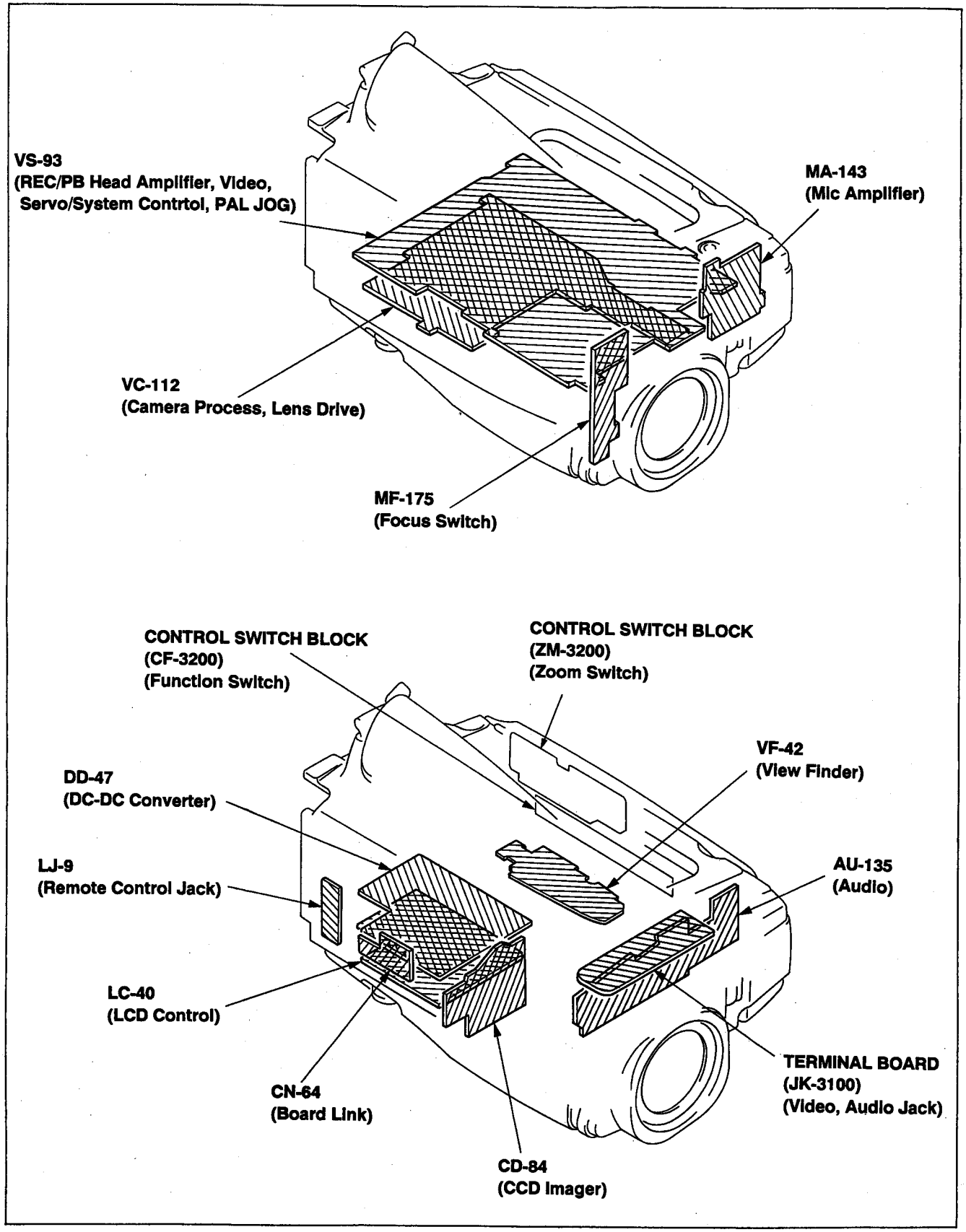
Drum assembly	A-7048-602-A (DGH-76A-R)
Rotary upper drum assembly	A-7049-536-A (DGR-76-R-(1)) (Color mark: Green, Green/Red, Black, Black/Red)
	A-7049-534-A (DGR-76-R-(2)) (Color mark: Red, Red/Red, Blue, Blue/Blue)

— Lower side —



SECTION 3
DIAGRAMS

3-1. CIRCUIT BOARDS LOCATION

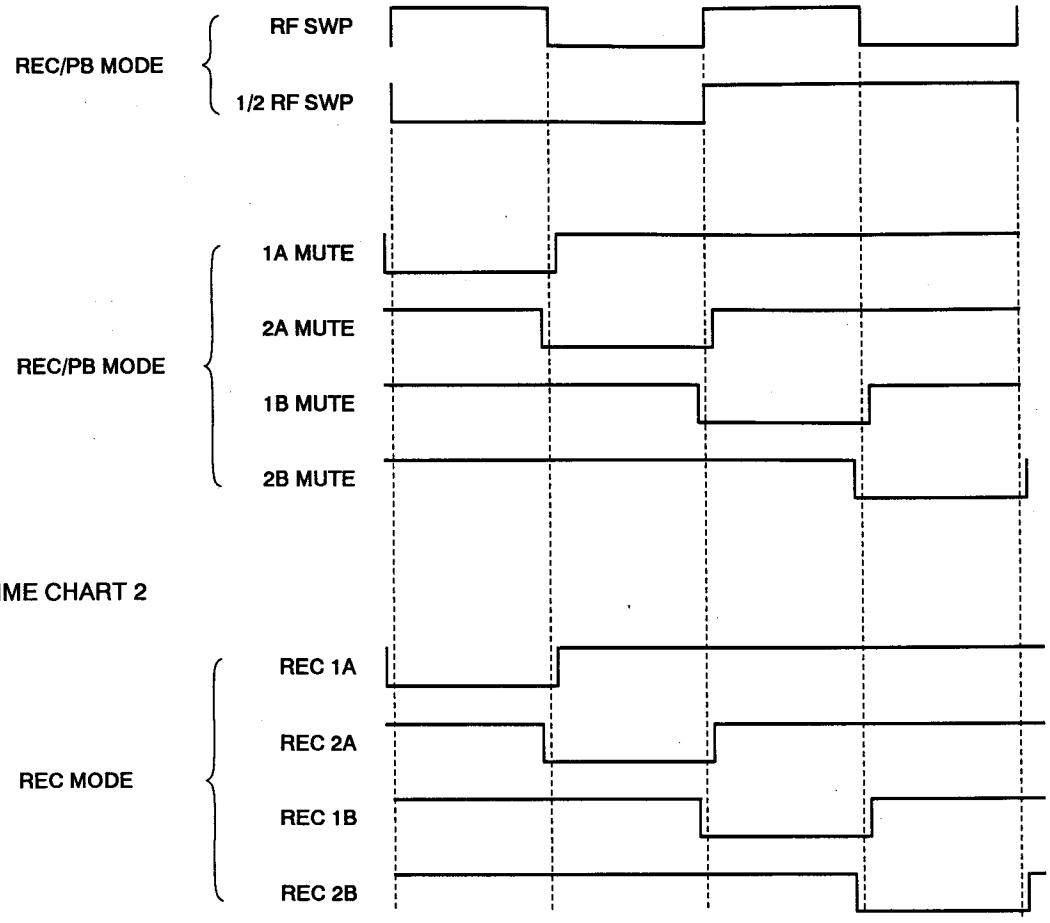


3-4. CAMERA MICROPROCESSOR PIN FUNCTION (IC709 ON VC-112 BOARD: CXP80624-285R/298R)

Pin No.	Signal	I/O	Function
1	ZOOM M REV	O	Zoom motor control signal. Normally "H". 20 msec period PWM signal when rotating to WIDE.
2	ZOOM M FWD	O	Zoom motor control signal. Normally "H". 20 msec period PWM signal when rotating to TELE.
3			Not used.
4			
5			
6	FOC END LED	O	Focus end sensor LED control signal. Normally "L".
7	RT05/D5		Not used.
8	CORE RESET	O	Camera core (IC707 on VC-112 board) reset signal. Normally "H". "L" when reset.
9	PDR RESET	O	Focus predriver (IC706 on VC-112 board) reset signal. Normally "H". "L" when reset.
10			Not used.
11	TG STBY0		
12	OPD RESET	O	OPD (IC705 on VC-112 board) reset signal. "H": camera mode. "L": VTR mode.
13			Not used.
14			
15			
16			
17			
18			
19			
20			
21	EPROM DO	O	Connected to +5V.
22	EPROM BUSY	I	BUSY signal from EEPROM. Normally "H". "L" pulse when data reading/writing.
23			Not used.
24			
25			Connected to +5V.
26			
27	WIDE END		Focus Zone sensor input. Normally "L".
28	FOC END FAR	I	Focus edge sensor input. Normally "L".
29	$\overline{\text{CAM ON}}$	O	Power supply control signal. Normally "L".
30			Not used.
31			
32			
33			
34			
35			
36			
37	MP		Connected to GND.
38	$\overline{\text{CAM RESET}}$	I	Reset signal input. Normally "H". "L" when reset.
39	VSS		GND
40	XTAL	O	10 MHz clock oscillation circuit.
41	EXTAL	I	
42	$\overline{\text{CS CAM}}$	I	Chip select signal from mode control microprocessor. (IC501 on LC-40 board)
43	VTR SI	I	Serial data input from mode control microprocessor.
44	VTR SO	O	Serial data output from mode control microprocessor.
45	VTR SCK	I	Serial data transfer clock.
46			Not used.
47			
48			
49			

Pin No.	Port Name	Signal	I/O	Connection	Function
42	P10/INT0	SYSTEM SYNC	I	all	(Edge detection vector interruption), System synchronization input port from CXP80624 (IC401 on VS-93 board).
43	P11/INT1	$\overline{\text{LI PRE END}}$	I		(Edge detection vector interruption), Lithium PRE END is selected with "L".
44	P12/INT2	$\overline{\text{LANC PWR ON}}$	I		Power on signal input from wired remote control. "L" when power switch pressed.
45	P13/TIO	TITLE BUSY	I	CAM	Titler IC (IC711 on VC-112 board) busy signal. Normally "L".
46	P20/PT00	VTR DD ON	O	PS	VTR power source (MOTOR 5V, VIDEO 5V, AUDIO 5V, EVF 5V, D5V, RP 5V, CORE 4V, D4V) control signal. "H" when power switch is in "VTR" or "CAMERA" position.
47	P21	CAM DD ON	O	PS	CAMERA power source (CAM 5V, +15V, –9V) control signal. "H" when power switch is in "CAMERA" position.
48	P22/PCL	$\overline{\text{VIDEO D/A CS}}$	O	VA	Serial data load signal to video circuit EVR (IC156, 158 on VS-93 board). 1V period "H" pulse.
49	P23/BUZ	AUTO LOCK LED	O		Not used.
50	P30/LCDCL	$\overline{\text{VIDEO CS}}$	O	VA	Chip select signal to Y process IC (IC151 on VS-93 board). 1V period "L" pulse.
51	P31/SYNC	$\overline{\text{VTR COSM CS}}$	O		Chip select signal to mechanism controller (IC401 on VS-93 board). 1V period "L" pulse.
52	P32	$\overline{\text{SG CS}}$	O	CAM	Chip select signal to sync generator (IC704 on VC-112 board). 1V period "L" pulse.
53	P33	$\overline{\text{CG STBY}}$	O		Standby signal for character generator (IC402 on VS-93 board). 1V period "H" pulse train.
54	VDD	VDD			VDD
55	XT1	XT1	I		SUB system clock. 32 kHz oscillation terminal.
56	XT2	XT2			
57	N.C.	N.C.			Connected to +5V.
58	X1	X1	I		Main system clock. 4.19 MHz oscillation terminal.
59	X2	X2	I		
60	P60/KK0	K IN 0	I	all	KEY matrix input. 1V period "L" pulse input when corresponding key is pressed. "H" when other case.
61	P61/KR1	K IN 1	I	all	
62	P62/KR2	K IN 2	I	all	
63	P63/KR3	K IN 3	I	all	
64	P70/KR4	K IN 4	I	all	
65	P71/KP5	K IN 5	I	all	
66	P72/KP6	K IN 6	I	all	
67	P73/KP7	$\overline{\text{CC DOWN}}$	I	MD	Cassette compartment lock switch input. "L": Lock.
68	$\overline{\text{RESET}}$	$\overline{\text{RESET}}$	I		System reset input. "L": Reset, Normally: "H".
69	S0	CLK CHK	O	LCD	Segment terminal drive signal to LCD. (Four value output of 0, 1.7, 3.3, 5V)
70	S1	S1	O	LCD	
71	S2	S2	O	LCD	
72	S3	S3	O	LCD	
73	S4	S4	O	LCD	
74	S5	S5	O	LCD	
75	S6	S6	O	LCD	
76	S7	S7	O	LCD	
77	S8	S8	O	LCD	
78	S9	S9	O	LCD	
79	S10	S10	O	LCD	
80	S11	S11	O	LCD	

TIME CHART 1

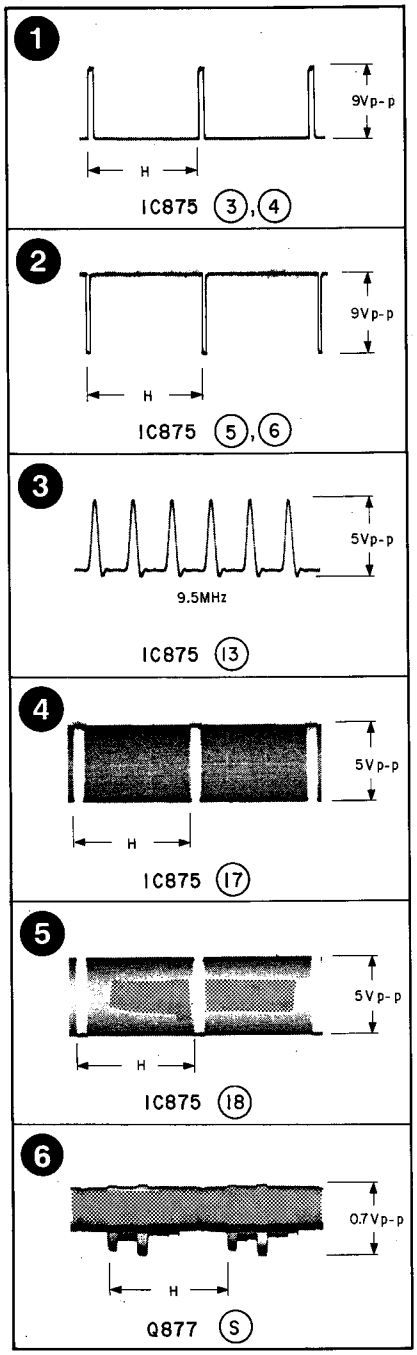


TIME CHART 2

Note on the CCD Imager replacement

- Some of this units require the correction data by the CCD imager (IC901 on CD-84 board), some do not.
  The correction data is input in F page and addresses 1D to 2C of the camera micro processor (IC709 on VC-112 board), and also written on the CCD data label put on the shield case (upper) of the DD-47 board.
  The correction data is not required for the CCD imager supplied for repair. Therefore, when replacing the CCD imager to which the CCD data label is put, remove the CCD data label and input 00 to F page and addresses 1D to 2C of the camera micro processor. Refer to the camera adjustment for input method.
- The CCD imager is not mounted for the already mounted CD-84 board supplied as the repair parts.
  When replacing the CD-84 board, remove the CCD imager from the old board and install on the new board.
- Perform all adjustments of the camera block when the CCD imager has been replaced.
- Handle the CCD imager with attention such as MOS IC as it may be broken by static electricity in the structure.
  Also, prevent the receiving light section from dust attached and strong light.

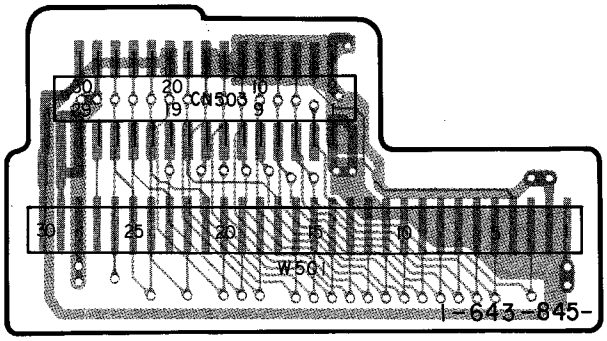
CD-84 BOARD



- **SIGNAL PATH**

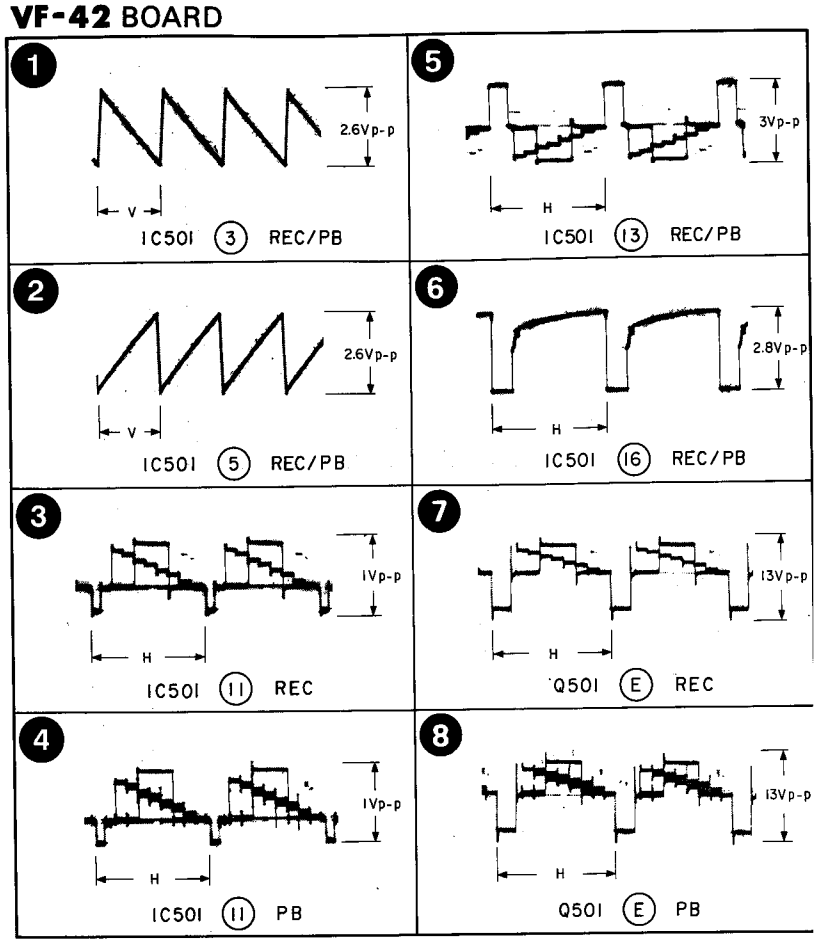
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➠	
PB				

CN-64 BOARD



- CN-64 board is the printed wiring board which has four layers structure but inner two layers' patterns and component side pattern are omitted.

VF-42 BOARD



< DIODE >

D501	8-719-820-65	DIODE TLS221
D502	8-719-984-02	LED BR4371F
D503	8-719-400-20	DIODE MA152WA

< IC >

IC501	8-759-420-01	IC AN2512S

< TRANSISTOR >

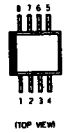
Q501	8-729-100-66	TRANSISTOR 2SC1623
Q502	8-729-216-31	TRANSISTOR 2SA1163-G
Q503	8-729-100-66	TRANSISTOR 2SC1623
Q504	8-729-106-68	TRANSISTOR 2SD1615A-G

- **For printed wiring boards.**

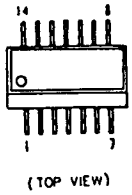
Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.

4-3. SEMICONDUCTORS

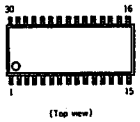
AK6420F
LM358D



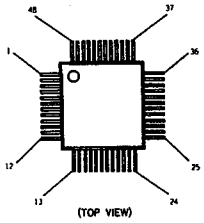
AN2512S



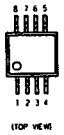
CXA-1618N-E2
MCD004BN



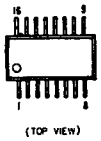
CXA1208R
CXA1481AR
CXA1488RR



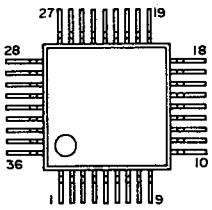
CXA1211M
NJM2234M
RC3414M



CXA1452
CXL5502M
MPC1727VMER

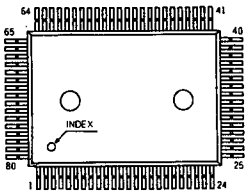


CXA1536QQ
LB8110M



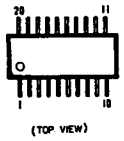
MARKING SIDE VIEW

CXD2100AQ
μPD75316GF

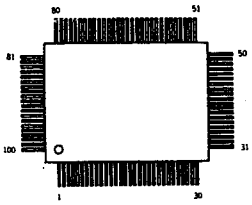


MARKING SIDE VIEW

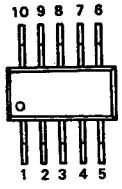
CXD1250N
CXD2104N
LC78865M
MB88346BPFV
MPC1724VMEL
μPD7564G-540



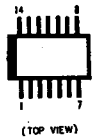
CXP80624-289R/281R



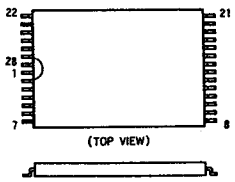
LB1830M



LM324D

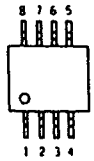


MB8464

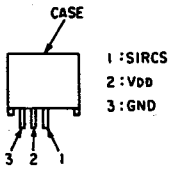


MCD002AR

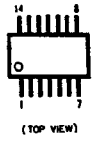
RC3414M



SBX1619-51

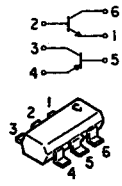


TL1596CDB
XRU4066BF

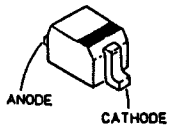


PT4850F

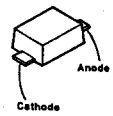
XP4601



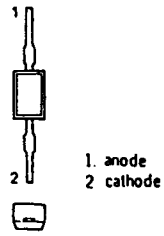
MA110



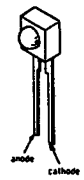
MA728



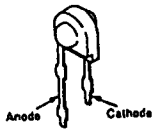
TLS221



BR4371F



GL453S

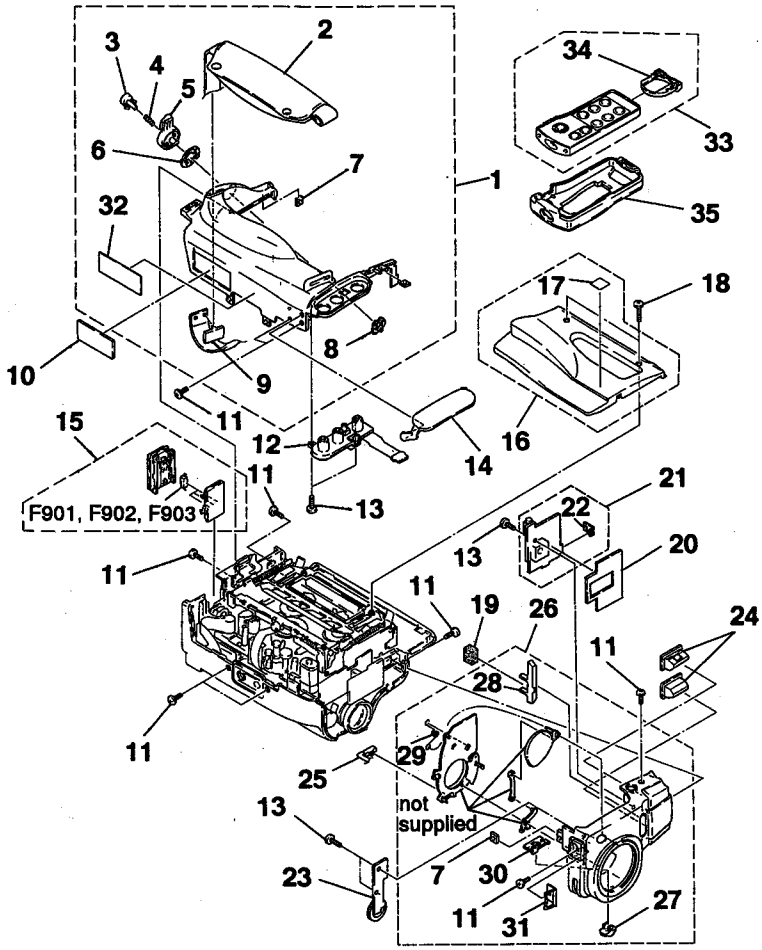


SECTION 5
EXPLODED VIEWS

NOTE:
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the last of this parts list.

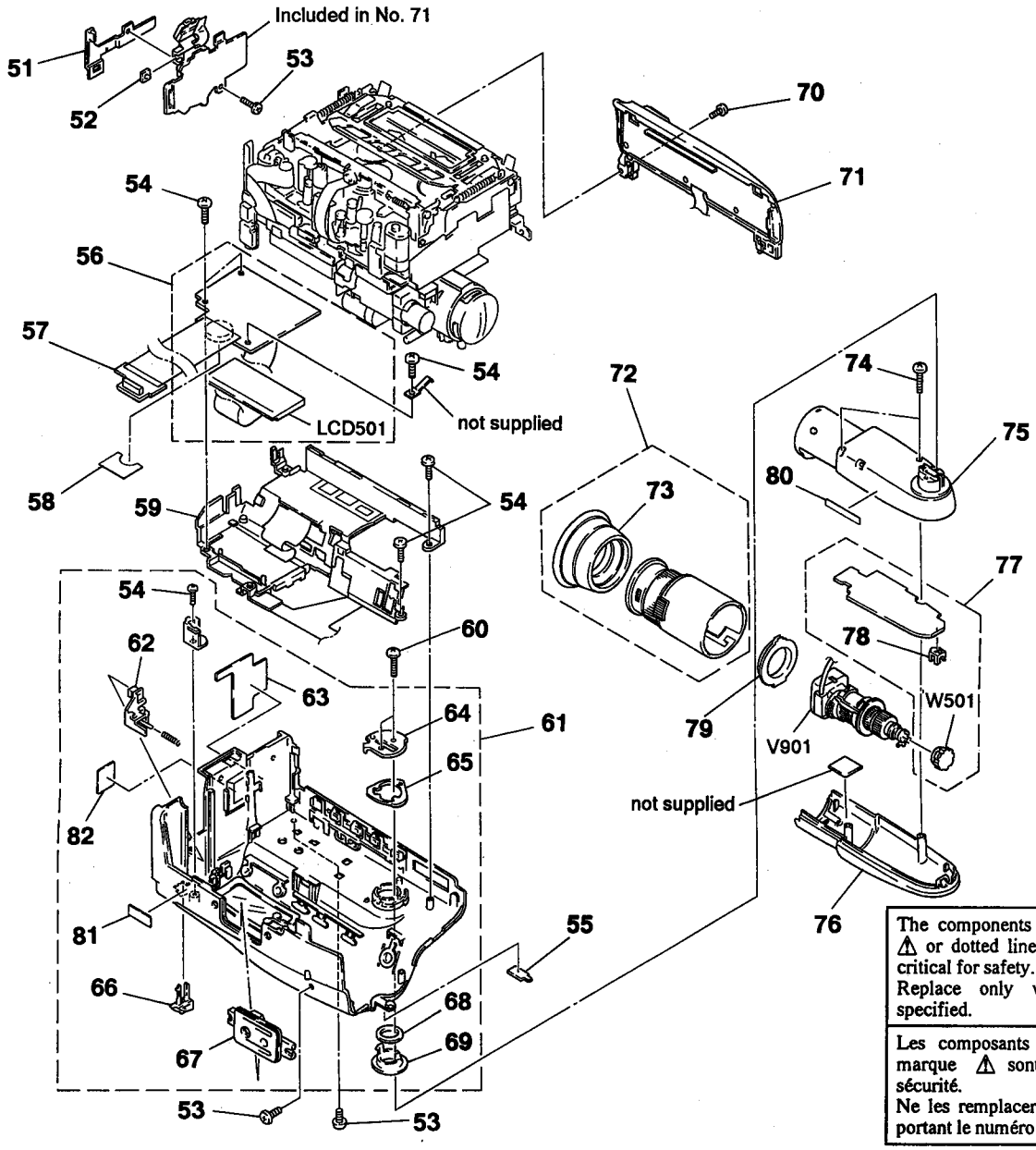
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spécifié.

5-1. CABINET (L) AND F PANEL ASSEMBLIES



Ref. No.	Part No.	Description	Remark
1	X-3941-618-1	CABINET (L) ASSY	
2	3-736-807-01	BELT, GRIP	
3	3-942-950-01	BUTTON, S/S	
4	3-578-221-00	SPRING, COMPRESSION	
5	3-942-985-01	KNOB, STAND-BY	
6	3-736-364-01	SPRING	
7	3-718-233-01	NUT, PLATE	
8	3-942-894-01	HOLDER, STAND-BY KNOB	
9	3-942-895-01	STOPPER, BELT	
* 10	3-947-634-01	LABEL, MODEL NUMBER (U/C)	
11	3-719-381-01	SCREW (M2X4)	
12	1-537-369-11	TERMINAL BOARD (JK-3100)	
13	3-719-601-01	SCREW (B2X5), TAPPING	
14	3-943-012-01	COVER, JACK	
15	1-537-368-11	TERMINAL BOARD (BATTERY)	
16	X-3941-615-1	LID ASSY, CASSETTE	
* 17	3-703-713-41	STICKER, SONY SYMBOL (10)	
18	3-727-902-11	SCREW (M1.4), SPECIAL	
* 19	3-948-551-01	CUSHION (1)	
* 20	3-948-472-01	CUSHION (MA)	
* 21	A-7063-175-A	MA-143 BOARD, COMPLETE	
* 22	3-947-506-01	PLATE, GROUND, MICROPHONE	
* 23	A-7071-609-A	MF-175 BOARD, COMPLETE	
24	A-7091-800-A	MICROPHONE UNIT	
25	1-692-084-11	SWITCH ASSY	
26	X-3941-584-1	PANEL ASSY, F	
27	3-942-905-01	KNOB, S	
28	3-947-361-01	PLATE, LIGHT GUIDE	
29	3-947-357-01	SPRING, TORSION	
30	3-947-800-01	HOLDER, S KNOB	
31	3-947-358-01	STAND	
32	3-703-845-01	LABEL (N) (U/C), MAIN CAUTION	
33	1-693-137-21	REMOTE COMMANDER (CAM CORDER) (RMT-701)	
34	3-708-412-01	LID, REMOTE COMMANDER	
35	3-943-154-11	HOLDER (B), REMOTE CONTROL	
⚠F901	1-532-778-21	FUSE, MICRO (1.6A 125V) (SECONDARY)	
⚠F902	1-532-778-21	FUSE, MICRO (1.6A 125V) (SECONDARY)	
⚠F903	1-532-778-21	FUSE, MICRO (1.6A 125V) (SECONDARY)	

5-2. CABINET (R) AND EVF ASSEMBLIES



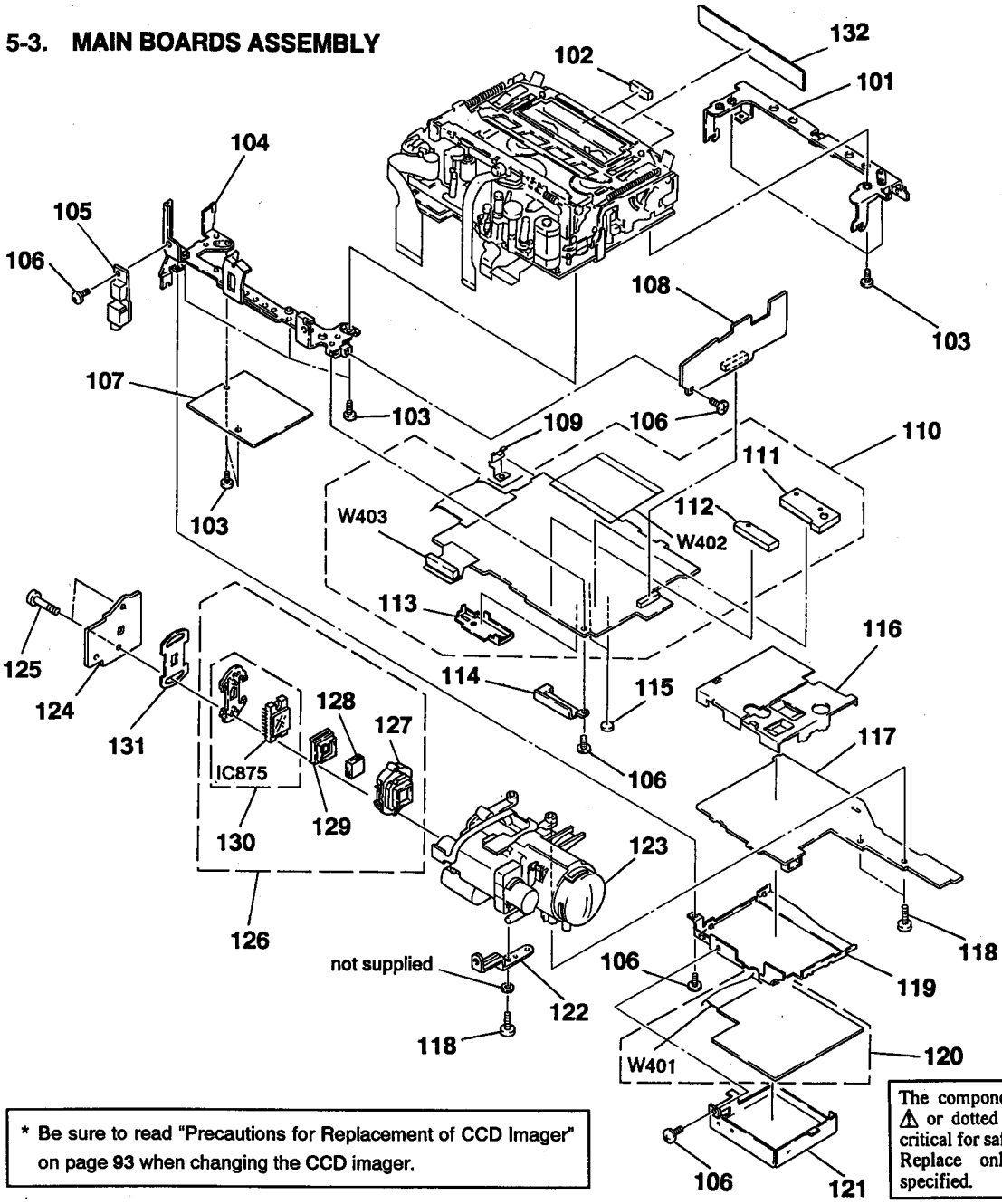
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une piéce portant le numéro spécifié.

Ref. No.	Part No.	Description	Remark
* 51	3-947-354-01	BRACKET (L)	
52	3-718-233-01	NUT, PLATE	
53	3-719-381-01	SCREW (M2X4)	
54	3-719-601-01	SCREW (B2X5), TAPPING	
* 55	3-948-630-01	CUSHION (RF)	
* 56	A-7063-174-A	LC-40 BOARD, COMPLETE	
* 57	A-7071-608-A	CN-64 BOARD, COMPLETE	
* 58	3-948-369-01	SHEET, BLIND	
59	1-466-711-11	SWITCH BLOCK, CONTROL (CF-3200)	
60	3-740-546-01	SCREW (M2X10)	
61	X-3941-585-1	CABINET (R) ASSY (US)	
61	X-3941-787-1	CABINET (R) ASSY (Canadian)	
62	3-947-449-01	LOCK, BATTERY	
* 63	3-944-102-01	LABEL, BATTERY FITTING	
64	3-942-897-01	PALTE, LOCK, TILT	
65	3-747-110-01	SPRING, LEAF, TILT	
66	3-943-068-01	KNOB, BATTERY	
67	3-942-911-01	SCREW, TRIPOD	

Ref. No.	Part No.	Description	Remark
68	3-747-112-01	RING, TILT	
69	3-747-109-01	SLEEVE, EVF	
70	3-713-786-51	SCREW (M2X3)	
71	1-466-710-21	SWITCH BLOCK, CONTROL (ZM-3200)	
72	X-3941-603-1	HOLDER ASSY, FINDER	
73	3-946-426-01	EYE CUP	
74	3-713-790-31	SCREW (M2X8), TAPPING, P3	
75	X-3940-706-1	CABINET (L) ASSY, EVF	
76	3-943-077-01	CABINET (R), EVF	
* 77	A-7062-836-A	VF-42 BOARD, COMPLETE	
78	3-942-888-01	HOLDER, LID	
79	3-747-116-01	COVER, CRT	
* 80	3-744-894-11	LABEL, EVF	
* 81	3-704-367-01	LABEL (US)	
* 82	3-704-256-01	LABEL, CAUTION (US)	
LCD501	1-809-671-21	DISPLAY PANEL, LIQUID CRYSTAL	
⚠V901	1-452-565-11	CRT ASSY	
⚠W501	1-540-019-21	SOCKET ASSY, CRT	

5-3. MAIN BOARDS ASSEMBLY



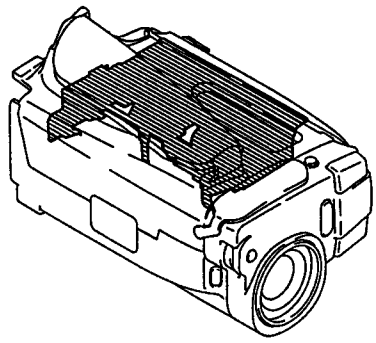
* Be sure to read "Precautions for Replacement of CCD Imager" on page 93 when changing the CCD imager.

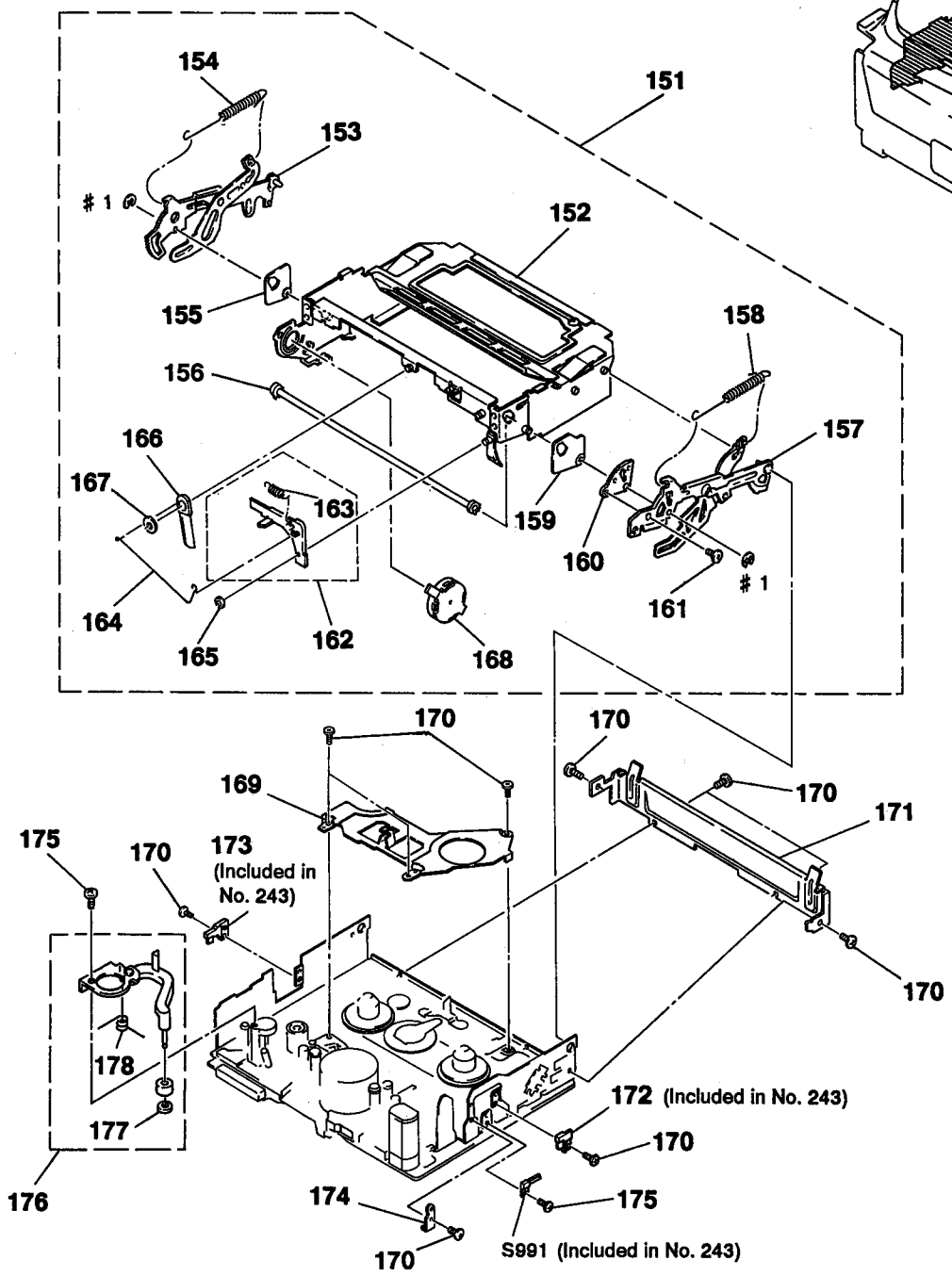
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
* 101	3-947-459-01	FRAME (UPPER)	
102	3-942-882-01	SPACER, FK	
103	3-703-816-41	SCREW (M1.4X2.5), SPECIAL HEAD	
* 104	3-942-921-11	FRAME (LOWER)	
* 105	A-7071-610-A	LJ-9 BOARD, COMPLETE	
106	3-713-786-51	SCREW (M2X3)	
107	3-943-959-11	SHEET, VM	
* 108	A-7063-173-A	AU-135 BOARD, COMPLETE	
* 109	3-947-355-01	PLATE, GROUND, VS	
* 110	A-7063-170-A	VS-93 BOARD, COMPLETE	
111	3-943-007-01	CASE (LOWER), SHIELD, RP	
112	3-943-009-01	PLATE, SHIELD, FE	
113	3-943-006-01	CASE (UPPER), SHIELD, RP	
114	3-943-008-01	PLATE, SHIELD, RP CONNECTOR	
115	3-943-014-01	CUSHION, RUBBER	
* 116	3-947-347-01	CASE (LOWER), SHIELD, VC	
* 117	A-7063-171-A	VC-112 BOARD, COMPLETE	
118	3-719-601-01	SCREW (B2X5), TAPPING	

Ref. No.	Part No.	Description	Remark
* 119	X-3941-473-1	CASE (UPPER) ASSY, SHIELD, VC	
* ⚠120	A-7063-169-A	DD-47 BOARD, COMPLETE (DC-DC CONVERTER UNIT)	
* 121	3-947-352-01	CASE (UPPER), SHIELD, DD	
* 122	3-947-442-01	BRACKET (A), FITTING	
123	1-547-548-11	LENS, ZOOM (VCL-6210WC)	
* 124	A-7063-172-A	CD-84 BOARD, COMPLETE	
125	3-947-268-01	SCREW (P TIGHT) (2), TAPPING	
126	A-7030-328-A	CCD ASSY (BOND)	
127	3-947-818-11	ADAPTOR (D), CCD FITTING	
128	1-547-558-21	FILTER BLOCK, OPTICAL	
129	3-947-820-11	RUBBER (D), SEAL	
130	A-7030-327-A	CCD BLOCK ASSY (BOND)	
* 131	3-947-821-01	SHEET (D), INSULATING	
132	3-943-701-01	LABEL, CAUTION	
IC875	8-752-606-79	IC ICX044BKA-1 (CCD IMAGER)	
W401	1-690-817-11	CABLE, FLAT	
W402	1-644-285-11	FP-572 FLEXIBLE BOARD	
W403	1-630-591-11	FP-182 FLEXIBLE BOARD	

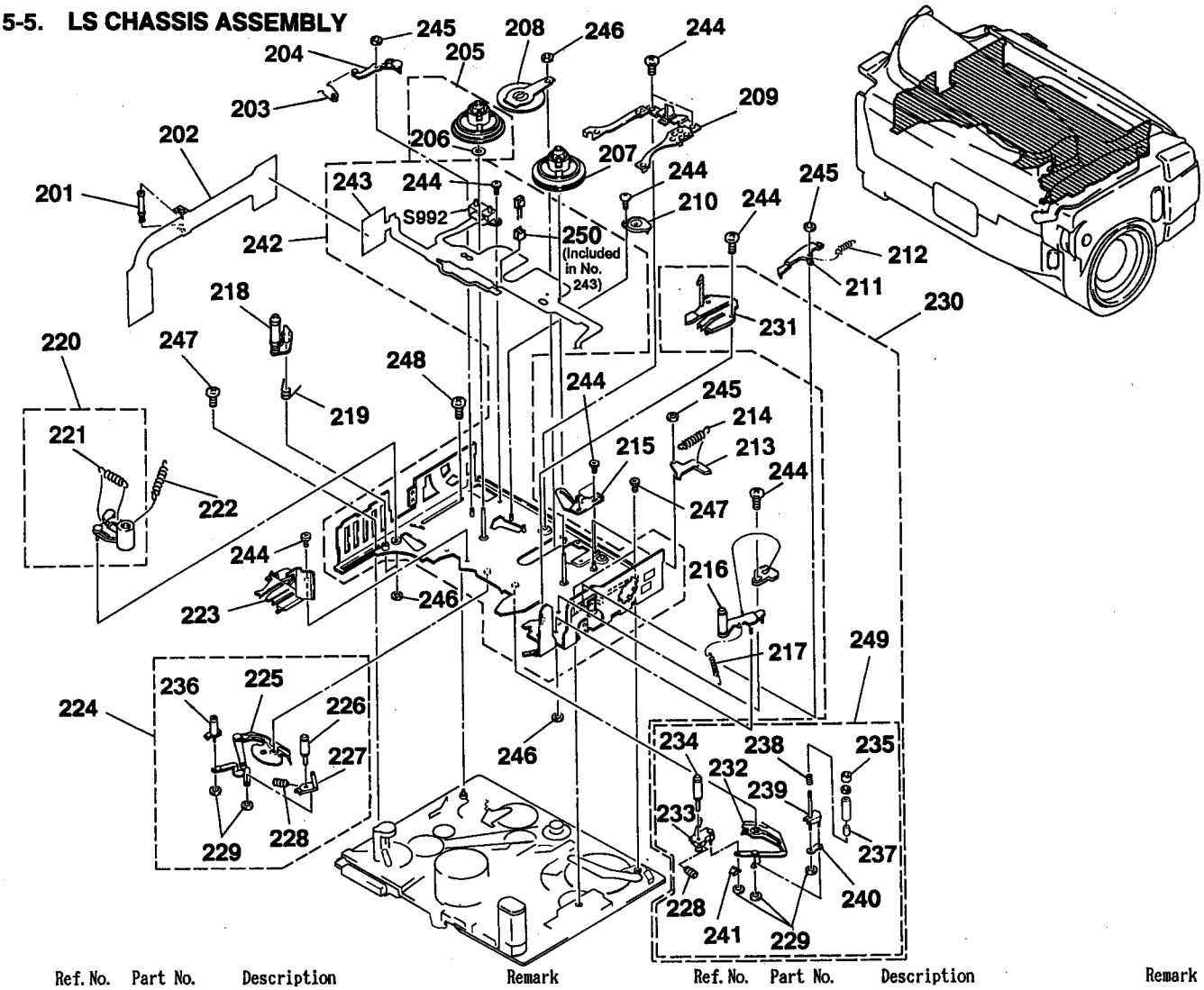
5-4. CASSETTE COMPARTMENT HOLDER ASSEMBLY





Ref. No.	Part No.	Description	Remark
151	A-7040-255-A	HOLDER BLOCK ASSY (L)	
152	X-3940-680-1	HOLDER ASSY (L)	
153	X-3940-677-1	ARM (T) ASSY (L), F	
154	3-739-872-01	SPRING, TENSION	
155	3-728-145-01	BEARING (T), MIDWAY GEAR	
156	X-3727-920-1	GEAR ASSY, MIDWAY	
157	X-3940-678-1	ARM (S) ASSY (L), F	
158	3-739-873-01	SPRING, TENSION	
159	3-728-146-01	BEARING (S), MIDWAY GEAR	
160	3-739-808-01	PLATE (2), ADJUSTMENT, C ARM	
161	3-728-126-01	SCREW (M1.4X2), SPECIAL HEAD	
162	A-7040-164-A	ARM BLOCK ASSY, TP	
163	3-509-127-00	SPRING, TENSION	
164	3-728-277-01	BAR, JOINT	
165	3-331-007-11	WASHER	
166	X-3940-991-1	PROTECTOR ASSY (2), T	
167	3-749-304-01	WASHER, STOPPER	
168	X-3739-809-1	DAMPER ASSY (2)	
169	3-942-924-01	BASE (L), LED	
170	3-728-103-11	SCREW (M1.4X1.6), SPECIAL HEAD	
171	3-943-055-01	FRAME (L), LS	
172	3-727-957-01	HOLDER (S), SENSOR	
173	3-727-954-01	HOLDER (T), SENSOR	
174	3-727-946-01	SUPPORT, LS	
175	3-728-148-11	SCREW (M1.4X2.5), SPECIAL HEAD	
176	A-7040-264-D	ROLLER BLOCK ASSY, HC	
177	3-321-393-11	WASHER, STOPPER	
178	3-943-439-02	SPRING, TORSION	
S991	1-572-611-11	SWITCH, LEAF (C LOCK)	

5-5. LS CHASSIS ASSEMBLY

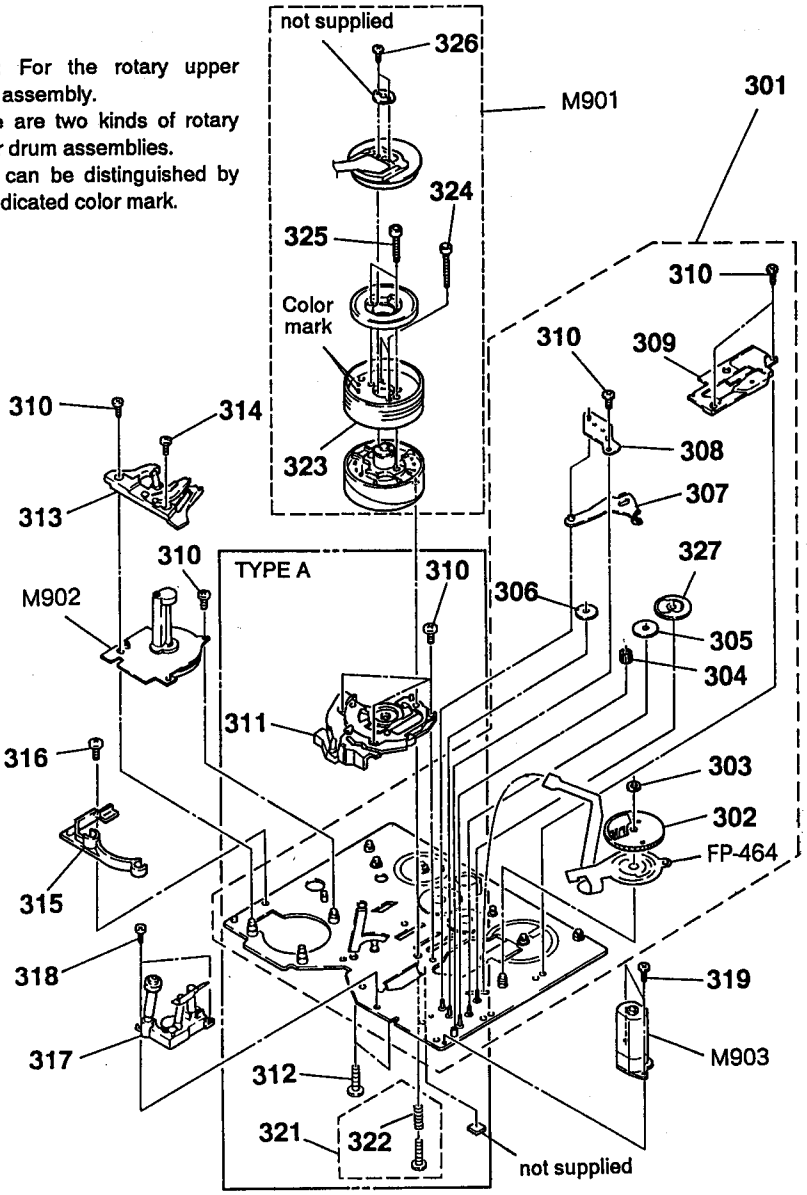


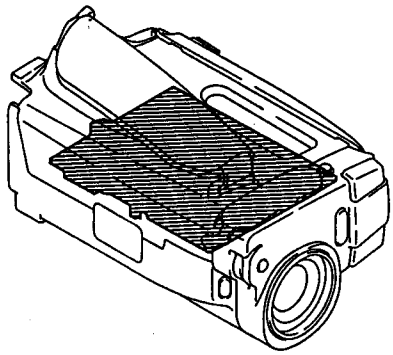
Ref. No.	Part No.	Description	Remark
201	3-739-807-01	SHAFT (2), FLEXIBLE ROTARY	
202	1-627-722-11	FP-149 FLEXIBLE BOARD	
203	3-732-068-01	SPRING (JD), RATCHET	
204	X-3728-005-1	RATCHET ASSY (JD), T	
205	X-3727-951-2	TABLE ASSY, REEL, TAKE-UP	
206	3-701-439-11	WASHER	
207	X-3727-952-1	TABLE ASSY, REEL, SUPPLY	
208	X-3727-926-1	ARM ASSY, GEAR	
209	X-3940-675-1	BASE ASSY (L), RL	
210	X-3727-914-4	CLUTCH ASSY, ONEWAY	
211	3-732-077-01	RATCHET (JD), S	
212	3-732-076-01	SPRING (JD), TENSION	
213	3-732-079-01	ARM (JD), S SOFT	
214	3-732-078-01	SPRING (JD), TENSION	
215	3-728-206-01	PLATE, CAM, LS	
216	X-3749-001-1	ARM ASSY (JD), TG1	
217	3-940-616-03	SPRING (JD), TENSION	
218	A-7040-252-A	ARM BLOCK ASSY (L), TG11	
219	3-727-939-01	SPRING (JD), TORSION	
220	A-7040-240-A	ARM BLOCK ASSY (JD), PINCH	
221	3-727-927-01	SPRING (POWER TENSION), TENSION	
222	3-732-089-01	SPRING (JD), TENSION	
223	3-728-244-01	RAIL (T), GUIDE	
224	A-7040-148-A	ARM (T) BLOCK ASSY, GUIDE	
225	X-3727-940-1	ARM (T) ASSY, GUIDE	
226	X-3728-004-1	ROLLER ASSY (2), TG8	

Ref. No.	Part No.	Description	Remark
227	X-3728-001-1	BASE ASSY (R), TG7	
228	3-728-290-01	SCREW (M1.2)	
229	3-331-007-11	WASHER	
230	A-7040-263-A	RAIL(S)BLOCK ASSY(3)(JD), GUIDE	
231	3-728-226-01	RAIL (S) (JD), GUIDE	
232	X-3727-941-1	ARM (S) ASSY, GUIDE	
233	X-3727-948-1	BASE ASSY, TG6	
234	X-3940-733-1	ROLLER ASSY (3), TG5	
235	3-943-822-01	FLANGE (P), TG4 UPPER	
236	X-3728-002-1	BASE ASSY (R), TG9	
237	3-728-048-01	SLEEVE, TG4	
238	3-728-023-01	SPRING, COMPRESSION	
239	X-3727-936-2	BASE ASSY, TG4	
240	3-728-053-01	PLATE, UNDER, TG4	
241	3-728-062-01	SPRING (6GB), LEAF	
242	A-7010-369-A	MD ASSY (1)	
243	A-7061-238-B	FP-115 BLOCK ASSY	
244	3-728-103-11	SCREW (M1.4X1.6), SPECIAL HEAD	
245	3-728-091-01	WASHER, STOPPER	
246	3-315-414-31	WASHER	
247	3-941-601-01	SCREW (M1.4X2.5), SPECIAL HEAD	
248	3-732-085-01	SCREW (1.2X1.6), SPECIAL HEAD	
249	A-7040-262-C	ARM (S) BLOCK ASSY (3), GUIDE	
250	3-732-046-01	HOLDER, LED	
S992	1-571-647-11	SWITCH PUSH (2 KEY) (REC PROOF, ME/MP)	

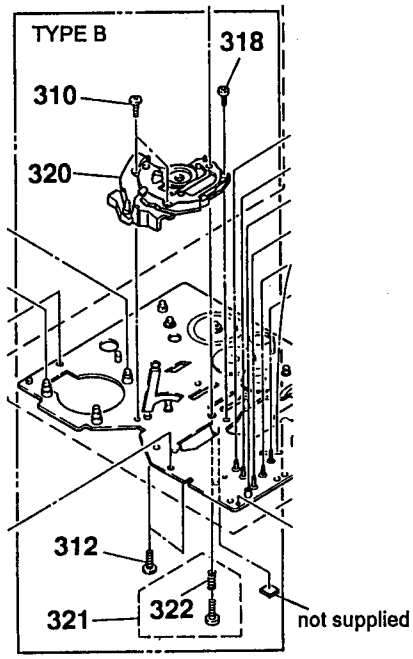
5-6. MECHANISM CHASSIS ASSEMBLY (1)

Note: For the rotary upper drum assembly.
There are two kinds of rotary upper drum assemblies.
They can be distinguished by the indicated color mark.





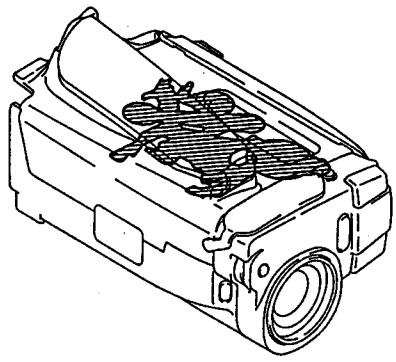
Note on FP-464
The FP-464 part, a component of the No. 301 mechanism chassis, is attached by hot-pressing, and it requires high mounting precision.
Therefore, it will not be supplied as a separate part.

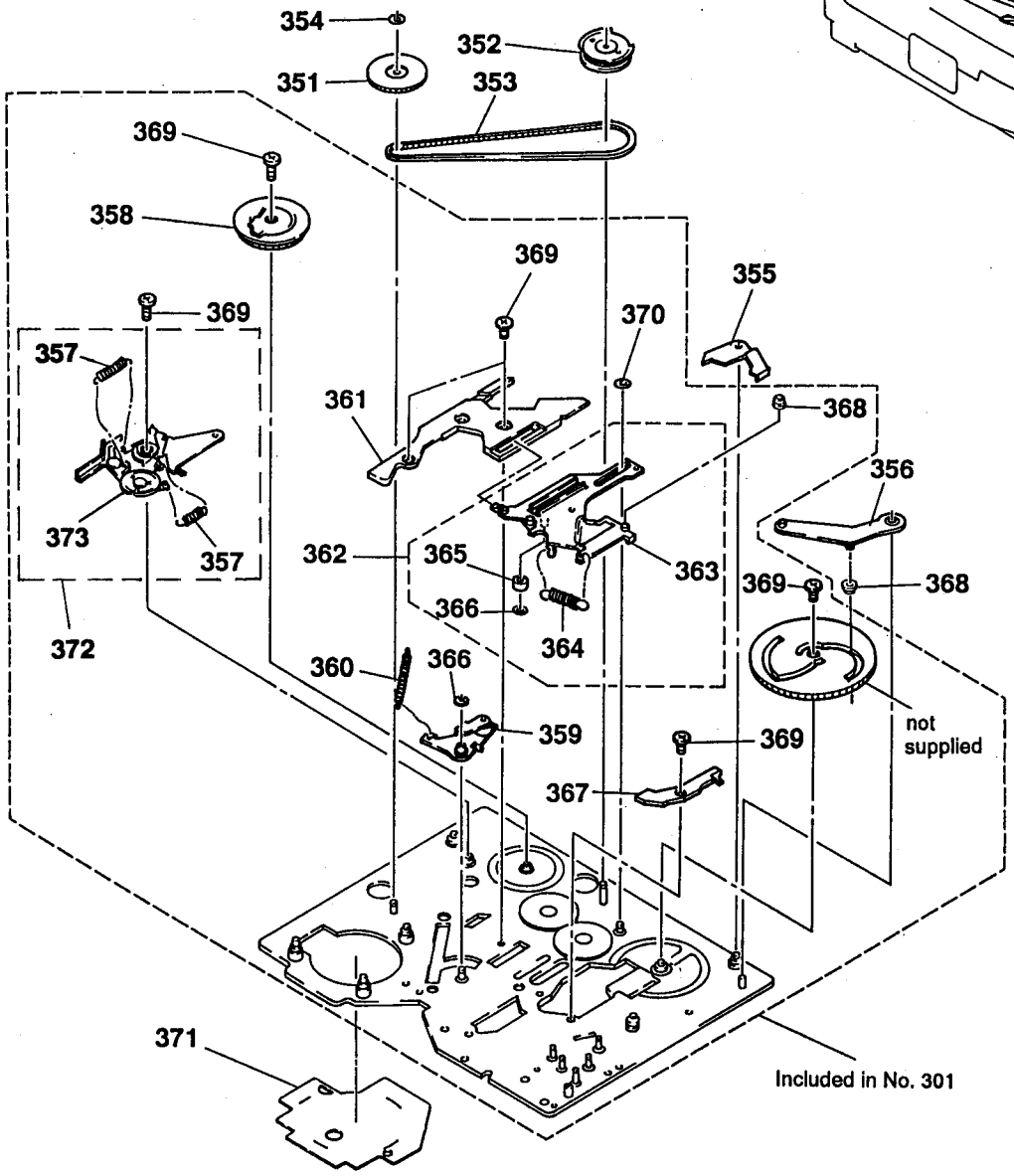


Ref. No.	Part No.	Description	Remark
301	A-7040-253-A	CHASSIS BLOCK ASST (L)	
302	X-3727-915-1	GEAR ASSY, MODE	
303	3-579-788-01	WASHER, STOPPER	
304	3-728-149-01	GEAR, NO. 0	
305	X-3727-904-1	GEAR ASSY, NO. 2	
306	X-3727-903-1	GEAR ASSY, NO. 1	
307	X-3727-906-1	ARM ASSY	
308	3-728-119-01	RETAINER, GEAR	
309	3-728-231-06	BASE, TG-1 CAM	
310	3-728-148-11	SCREW (M1.4X2.5), SPECIAL HEAD	
* 311	A-7040-222-D	BASE (M) BLOCK ASSY, DRUM (TYPE A)	
312	3-728-108-01	SCREW (M1.4X4.5)	
313	X-3941-027-2	RAIL (BASE) (3) ASSY (3), GUIDE	
314	3-732-084-01	SCREW (M1.4), SPECIAL HEAD	
315	3-732-064-01	COVER, ROTOR	
316	3-728-126-01	SCREW (M1.4X2), SPECIAL HEAD	
317	A-7040-289-A	BASE (1) BLOCK ASSY (2), RAIL	

Ref. No.	Part No.	Description	Remark
318	3-703-816-51	SCREW (M1.4X3.5), SPECIAL HEAD	
319	3-732-087-31	SCREW (M1.4X1.8), SPECIAL HEAD	
* 320	A-7040-203-A	BASE (A) BLOCK ASSY, DRUM (TYPE B)	
321	X-3728-009-2	SCREW ASSY, FITTING	
322	3-743-633-01	SPRING, COMPRESSION	
323	A-7049-534-A	DRUM ASSY, UPPER, ROTARY (DGR-76-R-(2)) (COLOR MARK; RED, RED/RED, BLUE, BLUE/BLUE)	
323	A-7049-536-A	DRUM ASSY, UPPER, ROTARY (DGR-76-R-(1)) (COLOR MARK; GREEN, GREEN/RED, BLACK, BLACK/RED)	
324	3-727-809-01	SCREW (M1.4X5), HEXAGON HOLE	
325	3-727-807-01	SCREW (M1.7X3.3), HEXAGON HOLE	
326	3-728-108-21	SCREW (M1.4X2.7)	
327	3-728-189-02	GEAR, NO. 3	
M901	A-7048-602-A	DRUM BLOCK ASSY (DGH-76A-R)	
M902	8-835-329-12	MOTOR, DC U-21A (CAPSTAN)	
M903	1-541-607-21	MOTOR, DC (LA12G-344VA) (LOADING)	

5-7. MECHANISM CHASSIS ASSEMBLY (2)

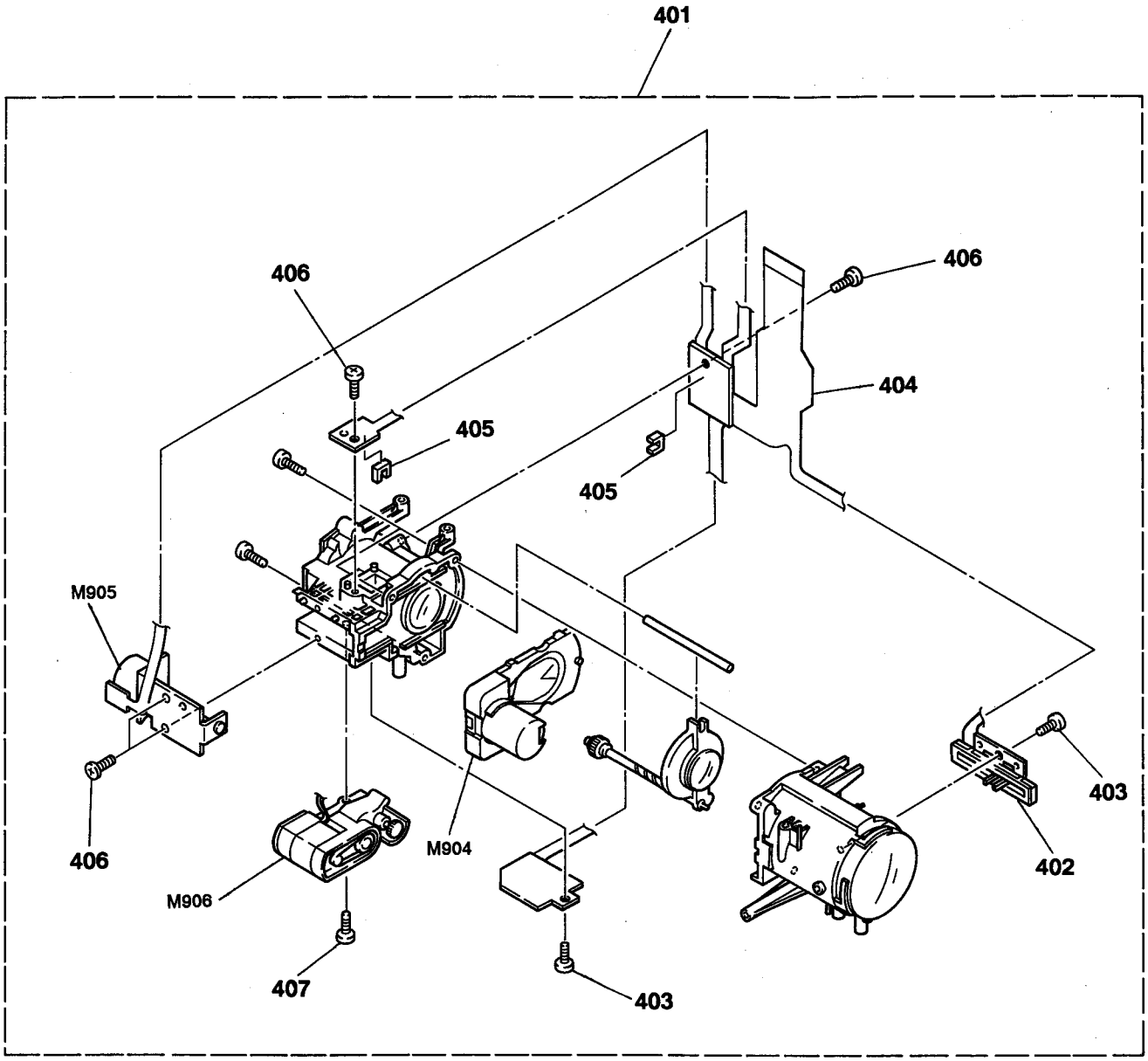




Ref. No.	Part No.	Description	Remark
351	X-3727-930-1	GEAR ASSY, CONVERSION	
352	X-3727-931-1	PULLEY ASSY, MIDWAY	
353	3-728-212-01	BELT, RELAY	
354	3-728-091-01	WASHER, STOPPER	
355	3-728-154-01	ARM, EJ	
356	3-941-980-01	ARM (T), LS	
357	3-728-065-01	SPRING, TENSION	
358	3-728-190-01	CAM (B)	
359	X-3727-924-2	ARM ASSY, GUIDE LOCK	
360	3-728-015-01	SPRING (POWER TENSION), TENSION	
361	3-728-228-03	SUPPORT (T), GL	
362	A-7040-153-A	SLIDER BLOCK ASSY, GL	

Ref. No.	Part No.	Description	Remark
363	X-3941-931-1	SLIDER ASSY, GL	
364	3-727-929-01	SPRING (POWER TENSION), TENSION	
365	3-728-144-01	ROLLER, GL	
366	3-331-007-11	WASHER	
367	3-728-213-01	SUPPORT (S), GL	
368	3-728-109-01	ROLLER, LS	
369	3-728-148-11	SCREW (M1.4X2.5), SPECIAL HEAD	
370	3-315-384-31	WASHER, STOPPER	
371	3-942-901-01	COVER (L), CAPSTAN	
372	A-7040-152-A	ARM BLOCK ASSY, PINCH PRESS	
373	X-3940-335-1	ARM ASSY, PINCH PRESS	

5-8. ZOOM LENS ASSEMBLY (VCL-6210WC)



Ref. No.	Part No.	Description	Remark
401	1-547-548-11	LENS, ZOOM (VCL-6210WC)	
402	3-708-446-01	METER, POTENTIAL	
403	3-708-053-01	SCREW, FB FITTING	
404	3-708-493-01	FLEXIBLE	
405	3-708-435-01	PHOTO INTERRUPTER	
406	3-707-946-01	SCREW	
407	3-708-450-01	SCREW, PZ	
M904	3-708-494-01	METER ASSY, IG (IRIS)	
M905	3-708-491-01	MOTOR ASSY, STEPPING (FOCUS)	
M906	3-708-492-01	MOTOR ASSY, PZ (ZOOM)	

AU-135

SECTION 6
ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL:Metal-film resistor.
  METAL OXIDE: Metal oxide-film resistor.
  F:nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u:μ, for example:
  uA..: μA.. uPA..: μPA..
  uPB..: μPB.. uPC..: μPC.. uPD..: μPD..
- CAPACITORS
  uF: μF
- COILS
  uH: μH

When indicating parts by reference number, please include the board.

The components identified by mark ⚠ or dotted line with mark. ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description			Remark
*	A-7063-173-A	AU-135 BOARD, COMPLETE			
		**********			
		(Ref. No. 1000 Series)			
		< CAPACITOR >			
C605	1-164-634-11	CERAMIC CHIP	1uF		16V
C606	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C607	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C608	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C609	1-163-989-11	CERAMIC CHIP	0.033uF	10%	25V
C610	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V
C611	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C612	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C613	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C615	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C616	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C617	1-164-634-11	CERAMIC CHIP	1uF		16V
C618	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V
C619	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C620	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C621	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C623	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C624	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C625	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C626	1-128-004-11	ELECT CHIP	10uF	20%	16V
C627	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V
C628	1-162-977-11	CERAMIC CHIP	0.0018uF	10%	50V
C629	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C630	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C631	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C633	1-164-634-11	CERAMIC CHIP	1uF		16V
C634	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C635	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C636	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C637	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C638	1-163-989-11	CERAMIC CHIP	0.033uF	10%	25V
C639	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V
C640	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C641	1-126-209-11	ELECT CHIP	100uF	20%	4V
C642	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V

Ref. No.	Part No.	Description			Remark
C643	1-128-004-11	ELECT CHIP	10uF	20%	16V
C645	1-126-209-11	ELECT CHIP	100uF	20%	4V
C646	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C647	1-164-634-11	CERAMIC CHIP	1uF		16V
C648	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V
C649	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C650	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C651	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C653	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C654	1-162-952-11	CERAMIC CHIP	82PF	5%	50V
C655	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C656	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C657	1-128-004-11	ELECT CHIP	10uF	20%	16V
C658	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V
C660	1-162-977-11	CERAMIC CHIP	0.0018uF	10%	50V
C661	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C662	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C663	1-164-634-11	CERAMIC CHIP	1uF		16V
C664	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C666	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C668	1-126-209-11	ELECT CHIP	100uF	20%	4V
C670	1-164-634-11	CERAMIC CHIP	1uF		16V
C672	1-162-638-11	CERAMIC CHIP	1uF		16V
C673	1-162-638-11	CERAMIC CHIP	1uF		16V
C674	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C675	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C676	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C677	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C678	1-128-003-11	ELECT CHIP	22uF	20%	4V
C679	1-128-003-11	ELECT CHIP	22uF	20%	4V
C680	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C681	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C683	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C684	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C687	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C688	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C689	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C690	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C691	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C692	1-164-360-11	CERAMIC CHIP	0.1uF		16V

Ref. No.	Part No.	Description			Remark
C694	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V
C695	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C696	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
		< CONNECTOR >			
CN601	1-691-539-11	CONNECTOR, BOARD TO BOARD 30P			
CN602	1-569-775-21	PIN, CONNECTOR 5P			
		< FILTER >			
FL601	1-236-837-21	FILTER, BAND PASS			
FL602	1-236-838-21	FILTER, BAND PASS			
		< IC >			
IC601	8-759-823-19	IC	CXA1488RR		
IC602	8-759-823-19	IC	CXA1488RR		
IC603	8-759-823-21	IC	CXA1536QQ		
IC604	8-759-509-05	IC	XRU4066BF		
		< TRANSISTOR >			
Q601	8-729-823-00	TRANSISTOR	2SA1622-5.6.7		
Q603	8-729-402-81	TRANSISTOR	XN4501		
Q604	8-729-402-81	TRANSISTOR	XN4501		
Q605	8-729-905-18	TRANSISTOR	DTC144EU		
Q606	8-729-402-81	TRANSISTOR	XN4501		
		< RESISTOR >			
R601	1-216-849-11	METAL CHIP	220K	5%	1/16W
R603	1-216-837-11	METAL CHIP	22K	5%	1/16W
R604	1-216-801-11	METAL CHIP	22	5%	1/16W
R605	1-216-859-11	METAL GLAZE	1.5M	5%	1/16W
R606	1-216-833-11	METAL CHIP	10K	5%	1/16W
R608	1-216-840-11	METAL CHIP	39K	5%	1/16W
R609	1-216-851-11	METAL CHIP	330K	5%	1/16W
R610	1-216-835-11	METAL CHIP	15K	5%	1/16W
R611	1-216-845-11	METAL CHIP	100K	5%	1/16W
R613	1-216-832-11	METAL CHIP	8.2K	5%	1/16W
R614	1-216-821-11	METAL CHIP	1K	5%	1/16W
R617	1-216-839-11	METAL CHIP	33K	5%	1/16W
R618	1-216-864-11	METAL CHIP	0	5%	1/16W
R619	1-216-833-11	METAL CHIP	10K	5%	1/16W
R620	1-216-849-11	METAL CHIP	220K	5%	1/16W
R622	1-216-837-11	METAL CHIP	22K	5%	1/16W
R623	1-216-859-11	METAL GLAZE	1.5M	5%	1/16W
R625	1-216-835-11	METAL CHIP	15K	5%	1/16W
R626	1-216-833-11	METAL CHIP	10K	5%	1/16W
R627	1-216-851-11	METAL CHIP	330K	5%	1/16W
R628	1-216-840-11	METAL CHIP	39K	5%	1/16W
R629	1-216-835-11	METAL CHIP	15K	5%	1/16W
R632	1-216-832-11	METAL CHIP	8.2K	5%	1/16W

Ref. No.	Part No.	Description			Remark
R633	1-216-821-11	METAL CHIP	1K	5%	1/16W
R634	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R635	1-216-817-11	METAL CHIP	470	5%	1/16W
R637	1-216-839-11	METAL CHIP	33K	5%	1/16W
R638	1-216-864-11	METAL CHIP	0	5%	1/16W
R639	1-216-833-11	METAL CHIP	10K	5%	1/16W
R640	1-216-848-11	METAL CHIP	180K	5%	1/16W
R642	1-216-845-11	METAL CHIP	100K	5%	1/16W
R643	1-216-817-11	METAL CHIP	470	5%	1/16W
R645	1-216-813-11	METAL CHIP	220	5%	1/16W
R646	1-216-819-11	METAL CHIP	680	5%	1/16W
R647	1-216-821-11	METAL CHIP	1K	5%	1/16W
R648	1-216-864-11	METAL CHIP	0	5%	1/16W
R649	1-216-821-11	METAL CHIP	1K	5%	1/16W
R651	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R652	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R653	1-216-795-11	METAL CHIP	6.8K	0.50%	1/16W
R654	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R655	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R656	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R657	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R658	1-218-708-11	METAL CHIP	4.7K	0.50%	1/16W
R659	1-218-716-11	METAL CHIP	10K	0.50%	1/16W
R661	1-216-821-11	METAL CHIP	1K	5%	1/16W
R662	1-216-821-11	METAL CHIP	1K	5%	1/16W
R663	1-216-834-11	METAL CHIP	12K	5%	1/16W
R664	1-216-833-11	METAL CHIP	10K	5%	1/16W
R666	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R667	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R668	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R669	1-216-821-11	METAL CHIP	1K	5%	1/16W
R670	1-216-821-11	METAL CHIP	1K	5%	1/16W

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* A-7063-172-A CD-84 BOARD, COMPLETE

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(Ref. No. 1000 Series)

< CAPACITOR >

C875	1-135-214-21	TANTAL. CHIP	4.7uF	20%	20V
C876	1-128-013-11	ELECT CHIP	1uF	20%	50V
C877	1-128-008-11	ELECT CHIP	3.3uF	20%	35V
C878	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C879	1-162-637-11	CERAMIC CHIP	0.47uF		16V
C880	1-126-607-11	ELECT CHIP	47uF	20%	4V
C881	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C882	1-128-004-11	ELECT CHIP	10uF	20%	16V
C883	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C884	1-164-156-11	CERAMIC CHIP	0.1uF		25V

CD-84 CN-64 DD-47

Ref. No.	Part No.	Description			Remark
		< CONNECTOR >			
CN875	1-573-523-21	CONNECTOR, BOARD TO BOARD 16P			
		< DIODE >			
D875	8-719-800-76	DIODE 1SS226			
D876	8-719-404-46	DIODE MA110			
D877	8-719-820-05	DIODE 1SS181			
D878	8-719-404-46	DIODE MA110			
		< COIL >			
L875	1-412-064-11	INDUCTOR CHIP 100uH			
		< TRANSISTOR >			
Q875	8-729-927-XX	TRANSISTOR 2SC4617R			
Q876	8-729-927-68	TRANSISTOR UMW1			
Q877	8-729-232-86	TRANSISTOR 2SK1875			
		< RESISTOR >			
R875	1-216-845-11	METAL CHIP	100K	5%	1/16W
R876	1-216-857-11	METAL CHIP	1M	5%	1/16W
R877	1-216-819-11	METAL CHIP	680	5%	1/16W
R878	1-216-843-11	METAL CHIP	68K	5%	1/16W
R879	1-216-849-11	METAL CHIP	220K	5%	1/16W
R880	1-216-839-11	METAL CHIP	33K	5%	1/16W
R881	1-216-835-11	METAL CHIP	15K	5%	1/16W
R882	1-216-850-11	METAL CHIP	270K	5%	1/16W
R883	1-216-833-11	METAL CHIP	10K	5%	1/16W
R884	1-216-828-11	METAL CHIP	3.9K	5%	1/16W
R885	1-216-809-11	METAL CHIP	100	5%	1/16W
**********					
*	A-7071-608-A	CN-64 BOARD, COMPLETE			
		**********			
		(Ref. No. 1000 Series)			
		< CONNECTOR >			
CN503	1-691-519-11	CONNECTOR, BOARD TO BOARD 30P			
		< FLAT CABLE >			
W501	1-690-818-11	CABLE, FLAT			
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Ref. No.	Part No.	Description			Remark
⚠ *	A-7063-169-A	DD-47 BOARD, COMPLETE			
		**********			
		(Ref. No. 4000 Series)			
*	3-947-352-01	CASE (UPPER), SHIELD, DD			
		< CAPACITOR >			
C901	1-164-361-11	CERAMIC CHIP	0.047uF		16V
C902	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C903	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C905	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C906	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C907	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C908	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C909	1-164-218-11	CERAMIC CHIP	180PF	0.25PF	50V
C910	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C911	1-162-960-11	CERAMIC CHIP	220PF	10%	50V
C912	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C913	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C914	1-162-960-11	CERAMIC CHIP	220PF	10%	50V
C915	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C916	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C918	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C919	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C920	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C921	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C922	1-135-215-21	TANTAL. CHIP	6.8uF	20%	16V
C923	1-165-178-11	CERAMIC CHIP	6.8uF		16V
C924	1-165-178-11	CERAMIC CHIP	6.8uF		16V
C925	1-162-638-11	CERAMIC CHIP	1uF		16V
C926	1-162-638-11	CERAMIC CHIP	1uF		16V
C927	1-135-177-21	TANTALUM CHIP	1uF	20%	20V
C928	1-135-177-21	TANTALUM CHIP	1uF	20%	20V
C929	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C930	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V
C931	1-135-215-21	TANTAL. CHIP	6.8uF	20%	16V
C932	1-165-178-11	CERAMIC CHIP	6.8uF		16V
C933	1-165-178-11	CERAMIC CHIP	6.8uF		16V
C934	1-165-178-11	CERAMIC CHIP	6.8uF		16V
C935	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V
C936	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V
C937	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V
C938	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V
C939	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V
C940	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V
C941	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V
C942	1-126-204-11	ELECT CHIP	47uF	20%	16V
C943	1-165-178-11	CERAMIC CHIP	6.8uF		16V
C944	1-165-178-11	CERAMIC CHIP	6.8uF		16V
C945	1-165-178-11	CERAMIC CHIP	6.8uF		16V

The components identified by mark ⚠ or dotted line with mark. ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description		Remark
C946	1-135-157-21	TANTALUM CHIP 10uF	20%	6.3V
C947	1-164-004-11	CERAMIC CHIP 0.1uF	10%	25V
C948	1-162-966-11	CERAMIC CHIP 0.0022uF	10%	50V
		< CONNECTOR >		
CN901	1-569-775-21	PIN, CONNECTOR 5P		
		< DIODE >		
D901	8-719-981-59	DIODE FC805		
D902	8-719-941-09	DIODE DAP202U		
D903	8-719-988-62	DIODE 1SS355		
		< IC >		
IC901	8-759-060-94	IC MB3785APFV-G-BND-ER		
IC902	8-759-998-98	IC LM358D		
		< COIL >		
L901	1-424-643-11	COIL, CHOKE 10uH		
L902	1-412-064-11	INDUCTOR CHIP 100uH		
L903	1-412-067-21	INDUCTOR CHIP 330uH		
L904	1-412-056-11	INDUCTOR CHIP 4.7uH		
L905	1-424-643-11	COIL, CHOKE 10uH		
L906	1-424-641-11	COIL, CHOKE 22uH		
L907	1-412-056-11	INDUCTOR CHIP 4.7uH		
L908	1-412-058-11	INDUCTOR CHIP 10uH		
L909	1-412-056-11	INDUCTOR CHIP 4.7uH		
L910	1-412-056-11	INDUCTOR CHIP 4.7uH		
L911	1-412-056-11	INDUCTOR CHIP 4.7uH		
L912	1-412-058-11	INDUCTOR CHIP 10uH		
L913	1-424-643-11	COIL, CHOKE 10uH		
L914	1-424-641-11	COIL, CHOKE 22uH		
L915	1-424-642-11	COIL, CHOKE 47uH		

Ref. No.	Part No.	Description			Remark
		< TRANSISTOR >			
Q901	8-729-905-18	TRANSISTOR DTC144EU			
Q902	8-729-403-27	TRANSISTOR XN4401			
Q903	8-729-804-41	TRANSISTOR 2SB1122-S			
Q904	8-729-905-12	TRANSISTOR DTA144EU			
Q905	8-729-015-61	TRANSISTOR 2SJ316-TD			
Q906	8-729-823-84	TRANSISTOR FP102			
Q907	8-729-805-25	TRANSISTOR 2SB1121-S			
Q908	8-729-822-84	TRANSISTOR 2SB1202FAST			
Q909	8-729-823-82	TRANSISTOR FP101			
Q910	8-729-823-82	TRANSISTOR FP101			
Q911	8-729-907-26	TRANSISTOR IMX1			
Q912	8-729-905-12	TRANSISTOR DTA144EU			
Q913	8-729-905-18	TRANSISTOR DTC144EU			
		< RESISTOR >			
R901	1-218-708-11	METAL CHIP	4.7K	0.50%	1/16W
R902	1-218-724-11	METAL CHIP	22K	0.50%	1/16W
R903	1-218-698-11	METAL CHIP	1.8K	0.50%	1/16W
R904	1-216-847-11	METAL CHIP	150K	5%	1/16W
R905	1-216-840-11	METAL CHIP	39K	5%	1/16W
R906	1-216-838-11	METAL CHIP	27K	5%	1/16W
R907	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R908	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R909	1-218-871-11	METAL CHIP	10K	0.50%	1/16W
R910	1-216-811-11	METAL CHIP	150	5%	1/16W
R911	1-218-716-11	METAL CHIP	10K	0.50%	1/16W
R912	1-216-833-11	METAL CHIP	10K	5%	1/16W
R913	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R914	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R915	1-216-833-11	METAL CHIP	10K	5%	1/16W
R916	1-216-841-11	METAL CHIP	47K	5%	1/16W
R917	1-216-843-11	METAL CHIP	68K	5%	1/16W
R918	1-216-837-11	METAL CHIP	22K	5%	1/16W
R919	1-216-837-11	METAL CHIP	22K	5%	1/16W
R920	1-218-716-11	METAL CHIP	10K	0.50%	1/16W
R921	1-216-845-11	METAL CHIP	100K	5%	1/16W
R922	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R923	1-216-845-11	METAL CHIP	100K	5%	1/16W
R924	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R925	1-216-845-11	METAL CHIP	100K	5%	1/16W
R926	1-216-845-11	METAL CHIP	100K	5%	1/16W
R927	1-216-840-11	METAL CHIP	39K	5%	1/16W

Ref. No.	Part No.	Description			Remark
R928	1-216-841-11	METAL CHIP	47K	5%	1/16W
R929	1-216-813-11	METAL CHIP	220	5%	1/16W
R930	1-216-819-11	METAL CHIP	680	5%	1/16W
R931	1-216-819-11	METAL CHIP	680	5%	1/16W
R932	1-216-819-11	METAL CHIP	680	5%	1/16W
R933	1-216-828-11	METAL CHIP	3.9K	5%	1/16W
R934	1-216-841-11	METAL CHIP	47K	5%	1/16W
R935	1-216-842-11	METAL CHIP	56K	5%	1/16W
R936	1-216-845-11	METAL CHIP	100K	5%	1/16W
R937	1-216-833-11	METAL CHIP	10K	5%	1/16W
R938	1-216-833-11	METAL CHIP	10K	5%	1/16W
R939	1-216-833-11	METAL CHIP	10K	5%	1/16W
R940	1-216-833-11	METAL CHIP	10K	5%	1/16W
R941	1-216-031-00	METAL CHIP	180	5%	1/10W
R942	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R943	1-216-833-11	METAL CHIP	10K	5%	1/16W
R944	1-216-841-11	METAL CHIP	47K	5%	1/16W
R945	1-218-716-11	METAL CHIP	10K	0.50%	1/16W
R946	1-218-680-11	METAL CHIP	330	0.50%	1/16W
R947	1-218-716-11	METAL CHIP	10K	0.50%	1/16W
R948	1-218-843-11	METAL CHIP	680	0.50%	1/16W
R949	1-218-865-11	METAL CHIP	5.6K	0.50%	1/16W
R950	1-218-716-11	METAL CHIP	10K	0.50%	1/16W
R951	1-216-864-11	METAL CHIP	0	5%	1/16W
		< TRANSFORMER >			
T901	1-450-785-21	TRANSFORMER, CONVERTER			

****

* FP-115 BOARD, COMPLETE

****

(Ref. No. 8000 Series)

3-727-957-01 HOLDER (S), SENSOR
3-732-046-01 HOLDER, LED

< DIODE >

D991	8-719-988-42	DIODE	GL453S

< HOLE ELEMENT >

H991	1-808-448-11	ELEMENT, HALL (CHIP TYPE)	
H992	1-808-448-11	ELEMENT, HALL (CHIP TYPE)	

< TRANSISTOR >

Q991	8-729-907-25	TRANSISTOR	PT4850F
Q992	8-729-907-25	TRANSISTOR	PT4850F

Ref. No.	Part No.	Description			Remark
		< RESISTOR >			
R991	1-216-817-11	METAL CHIP	470	5%	1/16W
R992	1-216-817-11	METAL CHIP	470	5%	1/16W
R993	1-216-817-11	METAL CHIP	470	5%	1/16W
R994	1-216-817-11	METAL CHIP	470	5%	1/16W
		< SWITCH >			
S991	1-572-611-11	SWITCH, LEAF			
S992	1-571-647-11	SWITCH, PUSH (2 KEY)			

****

* A-7063-174-A LC-40 BOARD, COMPLETE

****

(Ref. No. 4000 Series)

< CAPACITOR >

C501	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C502	1-162-915-11	CERAMIC CHIP	10PF	0.5PF	50V
C503	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C504	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C505	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V
C506	1-164-346-11	CERAMIC CHIP	1uF		16V
C507	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C509	1-164-346-11	CERAMIC CHIP	1uF		16V
C511	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C512	1-162-961-11	CERAMIC CHIP	330PF	10%	50V
C514	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C516	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C518	1-164-360-11	CERAMIC CHIP	0.1uF		16V

< CONNECTOR >

CN502	1-691-499-11	CONNECTOR, FFC/FPC 20P	

< DIODE >

D501	8-719-421-27	DIODE	MA728
D504	8-719-940-45	DIODE	DWA010
D505	8-719-988-62	DIODE	1SS355

< IC >

IC501	8-759-077-98	IC	uPD75316GF-SGX32002
IC502	8-759-056-84	IC	S-8420AF
IC503	8-759-145-63	IC	uPD7564G-540

< COIL >

L501	1-412-062-11	INDUCTOR CHIP 47uH	

Ref. No.	Part No.	Description			Remark
		< LIQUID CRYSTAL DISPLAY >			
LCD501	1-809-671-21	DISPLAY PANEL, LIQUID CRYSTAL			
		< TRANSISTOR >			
Q501	8-729-905-15	TRANSISTOR DTC144WU			
Q502	8-729-905-12	TRANSISTOR DTA144EU			
Q504	8-729-905-99	TRANSISTOR DTC114TU			
		< RESISTOR >			
R501	1-216-821-11	METAL CHIP	1K	5% 1/16W	
R502	1-216-851-11	METAL CHIP	330K	5% 1/16W	
R503	1-216-841-11	METAL CHIP	47K	5% 1/16W	
R504	1-216-821-11	METAL CHIP	1K	5% 1/16W	
R505	1-216-821-11	METAL CHIP	1K	5% 1/16W	
R506	1-216-841-11	METAL CHIP	47K	5% 1/16W	
R507	1-216-821-11	METAL CHIP	1K	5% 1/16W	
R508	1-216-827-11	METAL CHIP	3.3K	5% 1/16W	
R510	1-216-841-11	METAL CHIP	47K	5% 1/16W	
R512	1-216-845-11	METAL CHIP	100K	5% 1/16W	
R513	1-216-841-11	METAL CHIP	47K	5% 1/16W	
R514	1-216-864-11	METAL CHIP	0	5% 1/16W	
R515	1-216-821-11	METAL CHIP	1K	5% 1/16W	
R516	1-216-809-11	METAL CHIP	100	5% 1/16W	
R517	1-216-821-11	METAL CHIP	1K	5% 1/16W	
R518	1-216-864-11	METAL CHIP	0	5% 1/16W	
R519	1-216-296-00	METAL CHIP	0	5% 1/8W	
R520	1-216-841-11	METAL CHIP	47K	5% 1/16W	
R521	1-216-829-11	METAL CHIP	4.7K	5% 1/16W	
		< NETWORK RESISTOR >			
RB501	1-236-908-11	RESISTOR, NETWORK (CHIP TYPE)			
RB502	1-236-907-11	RESISTOR, NETWORK (CHIP TYPE)			
RB503	1-236-908-11	RESISTOR, NETWORK (CHIP TYPE)			
RB504	1-236-907-11	RESISTOR, NETWORK (CHIP TYPE)			
RB505	1-236-904-11	RESISTOR, NETWORK (CHIP TYPE)			
RB506	1-236-904-11	RESISTOR, NETWORK (CHIP TYPE)			
RB507	1-236-904-11	RESISTOR, NETWORK (CHIP TYPE)			
RB508	1-236-412-11	NETWORK, RES 1.0K			
RB509	1-236-904-11	RESISTOR, NETWORK (CHIP TYPE)			
RB510	1-236-904-11	RESISTOR, NETWORK (CHIP TYPE)			
RB512	1-236-432-11	NETWORK, RES 47K			
RB514	1-236-432-11	NETWORK, RES 47K			
RB515	1-236-400-11	NETWORK, RES 100			
RB516	1-236-412-11	NETWORK, RES 1.0K			
		< SWITCH >			
S507	1-692-085-11	SWITCH, ROTARY (EXPOSURE dial)			

Ref. No.	Part No.	Description			Remark
		< VIBRATOR >			
X501	1-579-063-21	VIBRATOR, CERAMIC (4.19MHz)			
X502	1-579-049-21	VIBRATOR, CRYSTAL (32KHz)			
X503	1-579-551-11	VIBRATOR, CERAMIC (700KHz)			
**********					
*	A-7071-610-A	LJ-9 BOARD, COMPLETE			
		**********			
		(Ref. No. 5000 Series)			
		< CAPACITOR >			
C971	1-162-964-11	CERAMIC CHIP	0.001uF	10% 50V	
C972	1-162-964-11	CERAMIC CHIP	0.001uF	10% 50V	
		< CONNECTOR >			
* CN971	1-580-056-21	PIN, CONNECTOR 3P			
		< DIODE >			
D973	8-719-988-62	DIODE 1SS355			
		< JACK >			
J971	1-565-276-21	JACK, ULTRA SMALL 1P (REMOTE)			
		< COIL >			
L971	1-410-369-11	INDUCTOR CHIP 1uH			
L972	1-410-369-11	INDUCTOR CHIP 1uH			
L973	1-410-369-11	INDUCTOR CHIP 1uH			
**********					
*	A-7063-175-A	MA-143 BOARD, COMPLETE			
		**********			
		(Ref. No. 5000 Series)			
*	3-947-506-01	PLATE, GROUND, MICROPHONE			
		< CAPACITOR >			
C551	1-162-970-11	CERAMIC CHIP	0.01uF	10% 25V	
C552	1-162-970-11	CERAMIC CHIP	0.01uF	10% 25V	
C556	1-163-809-11	CERAMIC CHIP	0.047uF	10% 25V	
C557	1-164-227-11	CERAMIC CHIP	0.022uF	10% 25V	
C558	1-164-222-11	CERAMIC CHIP	0.22uF	25V	
C559	1-162-964-11	CERAMIC CHIP	0.001uF	10% 50V	
C561	1-135-181-21	TANTALUM CHIP	4.7uF	20% 6.3V	
C562	1-135-181-21	TANTALUM CHIP	4.7uF	20% 6.3V	
C563	1-164-633-11	CERAMIC CHIP	0.1uF	10% 25V	
C564	1-164-633-11	CERAMIC CHIP	0.1uF	10% 25V	
C566	1-126-205-11	ELECT CHIP	47uF	20% 6.3V	
C567	1-164-633-11	CERAMIC CHIP	0.1uF	10% 25V	
C568	1-163-809-11	CERAMIC CHIP	0.047uF	10% 25V	
C569	1-135-091-00	TANTALUM CHIP	1uF	20% 16V	
C570	1-164-343-11	CERAMIC CHIP	0.056uF	10% 25V	

Ref. No.	Part No.	Description			Remark
C571	1-164-343-11	CERAMIC CHIP	0.056uF	10%	25V
C572	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C574	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C575	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C577	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C578	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C579	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C580	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C581	1-164-343-11	CERAMIC CHIP	0.056uF	10%	25V
C582	1-164-343-11	CERAMIC CHIP	0.056uF	10%	25V
C584	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C585	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C586	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C591	1-124-778-00	ELECT CHIP	22uF	20%	6.3V
C592	1-162-963-11	CERAMIC CHIP	680PF	10%	50V
		< CONNECTOR >			
CN551	1-691-550-11	PIN, CONNECTOR (1.5MM) (SMD) 3P			
CN552	1-691-550-11	PIN, CONNECTOR (1.5MM) (SMD) 3P			
CN553	1-573-768-21	PIN, CONNECTOR (1.5MM) (SMD) 5P			
CN554	1-573-506-41	CONNECTOR, FPC (NON ZIF) 4P			
		< DIODE >			
D551	8-719-404-46	DIODE	MA110		
D552	8-719-404-46	DIODE	MA110		
		< IC >			
IC551	8-759-062-23	IC	CXA1618N-E2		
IC552	8-741-100-63	IC	SBX1619-51		
IC553	8-759-998-98	IC	LM358D		
		< JACK >			
J551	1-691-737-11	JACK, SMALL (EXT MIC)			
		< TRANSISTOR >			
Q551	8-729-010-80	TRANSISTOR	FC13		
Q555	8-729-120-28	TRANSISTOR	2SC1623-L5L6		
		< RESISTOR >			
R551	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R552	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R553	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R554	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R555	1-216-841-11	METAL CHIP	47K	5%	1/16W
R556	1-216-841-11	METAL CHIP	47K	5%	1/16W
R557	1-216-841-11	METAL CHIP	47K	5%	1/16W
R558	1-216-845-11	METAL CHIP	100K	5%	1/16W
R559	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R560	1-216-857-11	METAL CHIP	1M	5%	1/16W

Ref. No.	Part No.	Description			Remark
R561	1-216-837-11	METAL CHIP	22K	5%	1/16W
R566	1-216-854-11	METAL CHIP	560K	5%	1/16W
R567	1-216-864-11	METAL CHIP	0	5%	1/16W
R568	1-216-857-11	METAL CHIP	1M	5%	1/16W
R569	1-216-857-11	METAL CHIP	1M	5%	1/16W
R570	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R571	1-216-833-11	METAL CHIP	10K	5%	1/16W
R572	1-216-833-11	METAL CHIP	10K	5%	1/16W
R573	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R575	1-216-837-11	METAL CHIP	22K	5%	1/16W
R576	1-216-839-11	METAL CHIP	33K	5%	1/16W
R577	1-216-834-11	METAL CHIP	12K	5%	1/16W
R580	1-216-833-11	METAL CHIP	10K	5%	1/16W
R581	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R582	1-216-833-11	METAL CHIP	10K	5%	1/16W
R584	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R585	1-216-833-11	METAL CHIP	10K	5%	1/16W
R586	1-216-837-11	METAL CHIP	22K	5%	1/16W
R587	1-216-839-11	METAL CHIP	33K	5%	1/16W
R588	1-216-834-11	METAL CHIP	12K	5%	1/16W
R589	1-216-805-11	METAL CHIP	47	5%	1/16W
R590	1-216-295-00	METAL CHIP	0	5%	1/10W
R591	1-216-295-00	METAL CHIP	0	5%	1/10W
R592	1-216-295-00	METAL CHIP	0	5%	1/10W
R593	1-216-821-11	METAL CHIP	1K	5%	1/16W
R594	1-216-821-11	METAL CHIP	1K	5%	1/16W

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* A-7071-609-A MF-175 BOARD, COMPLETE

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(Ref. No. 6000 Series)

< CONNECTOR >

CN996 1-691-473-21 CONNECTOR, FFC/FPC 7P
CN997 1-573-506-41 CONNECTOR, FPC (NON ZIF) 4P

< SWITCH >

S996 1-241-865-11 RES, VAR, CARBON 10K (FOCOS MANUAL)
S997 1-571-787-41 SWITCH, TACTILE (FADER)

****

* A-7063-171-A VC-112 BOARD, COMPLETE

****

(Ref. No. 2000 Series)

3-943-014-01 CUSHION, RUBBER
* 3-947-347-01 CASE (LOWER), SHIELD, VC

< CAPACITOR >

C701	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V
C702	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C703	1-164-361-11	CERAMIC CHIP	0.047uF		16V

SECTION 7
CAMERA SECTION ADJUSTMENTS

When performing adjustments, refer to the layout diagrams for adjustment related parts beginning from page 214.

7-1. PREPARATIONS BEFORE ADJUSTMENT (CAMERA SECTION)

7-1-1. List of Service Tools

- Oscilloscope
- Adjusting driver
- Stabilized power supply
- Color monitor
- Vectorscope
- Digital voltmeter

Ref. No.	Name	Part Code	Usage
J-1	Filter for color temperature correction (C14)	J-6080-058-A	Auto white balance adjustment/check White balance adjustment/check
J-2	ND filter 1.0	J-6080-808-A	Max gain adjustment (2 used) White balance check
	ND filter 0.4	J-6080-806-A	Max gain adjustment
	ND filter 0.3	J-6080-818-A	White balance adjustment
	ND filter 0.1	J-6080-807-A	Max gain adjustment
J-3	Pattern box PTB-500	J-6029-140-A	
J-4	Color chart for pattern box	J-6020-250-A	
J-5	Adjusting remote control unit (RM-95-remodeled in part)[Note 1]	J-6082-053-A	
J-6	Extension cord (10P, 1 mm)	J-6082-064-A	For extension of JK-3100 board
J-7	Extension cord (30P, 0.8 mm)	J-6082-135-A	For extension of LC-40 board (For the video and the camera section adjustment)
			For extension of AU-135 board (During the repair of AU-135 board)
J-8	Extension cord (16P, 0.8 mm)	J-6082-136-A	For the extension of the lens block (During the repair of the camera section)
J-9	Relay board (21P, 0.5 mm)[Note 2]	J-6082-176-A	For the extension of the lens block (During the repair of the camera section)
J-10	Measuring pin for camera section	J-6082-139-A	For the camera section adjustment
J-11	Measuring pin for video section	J-6082-140-A	For the video section adjustment
J-12	Siemens star	J-6080-875-A	For flange back check
J-13	Extension cord (20P, 0.5 mm)[Note 2]	J-6082-138-A	For extension between the lens block (FPC) and VC-112 board (CN851) (During the repair of the camera section)

Note 1: If the micro processor IC in the adjusting remote control unit is not the new micro processor (UPD7503G-C56-12), the switchover of the page cannot be carried out. In this case, replace with the new micro processor (8-759-148-35).

Note 2: The extension code (J-6082-136-A) is also attached with a 21P, 0.5 mm code. Connect this code to the relay board (J-6082-136-A) for extensions between the lens block (FPC) and VC-112 board (CN851).

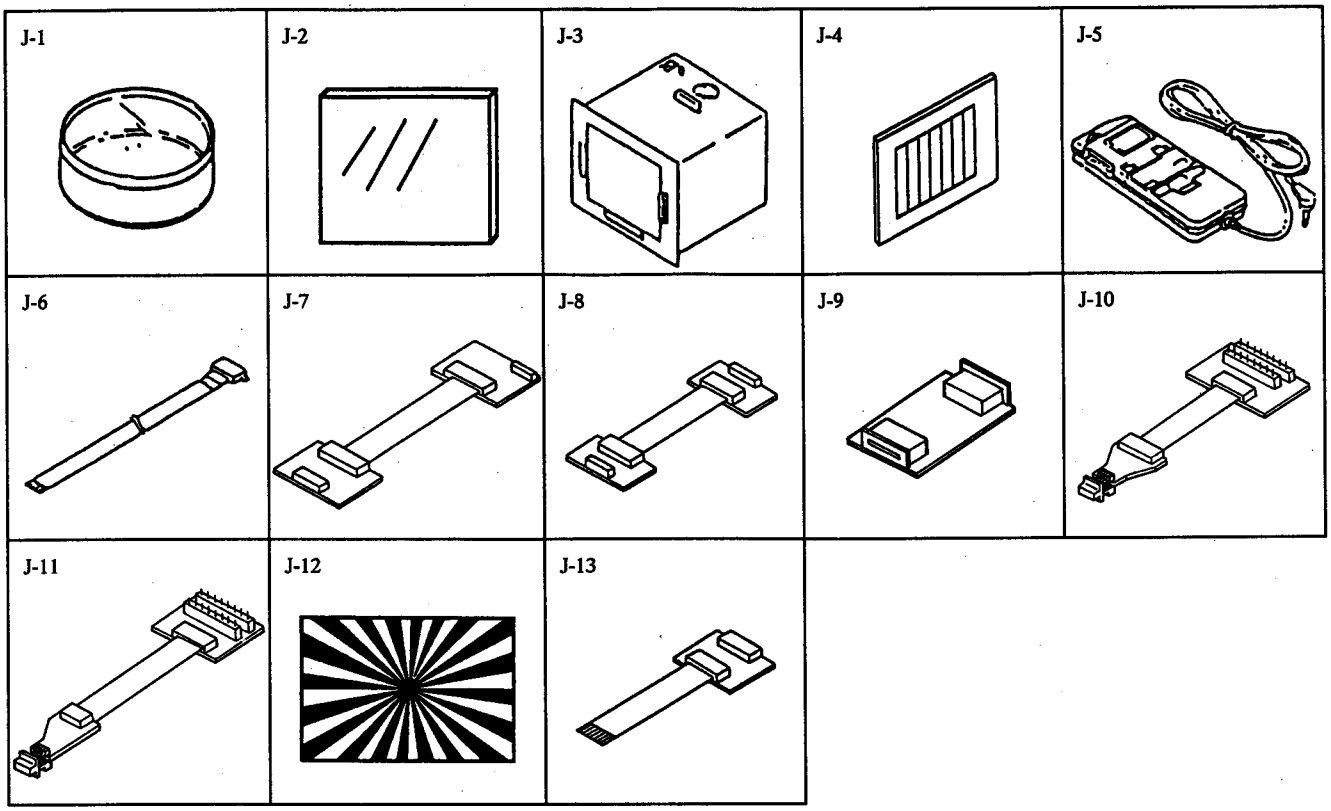


Fig. 7-1.

7-1-2. Preparations

Note: For further details on how to remove the cabinet and each board, refer to "1. Disassembly".

1) Connect the equipments for adjustment as shown in Fig. 7-3.
2) The EVF (Electronic viewfinder) is required for checking the white balance mode and shutter speeds. If the EVF is not required, remove the VS-93 board CN102.

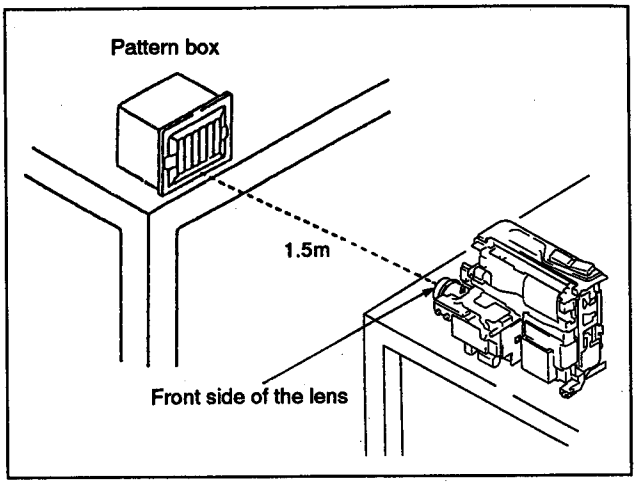


Fig. 7-2.

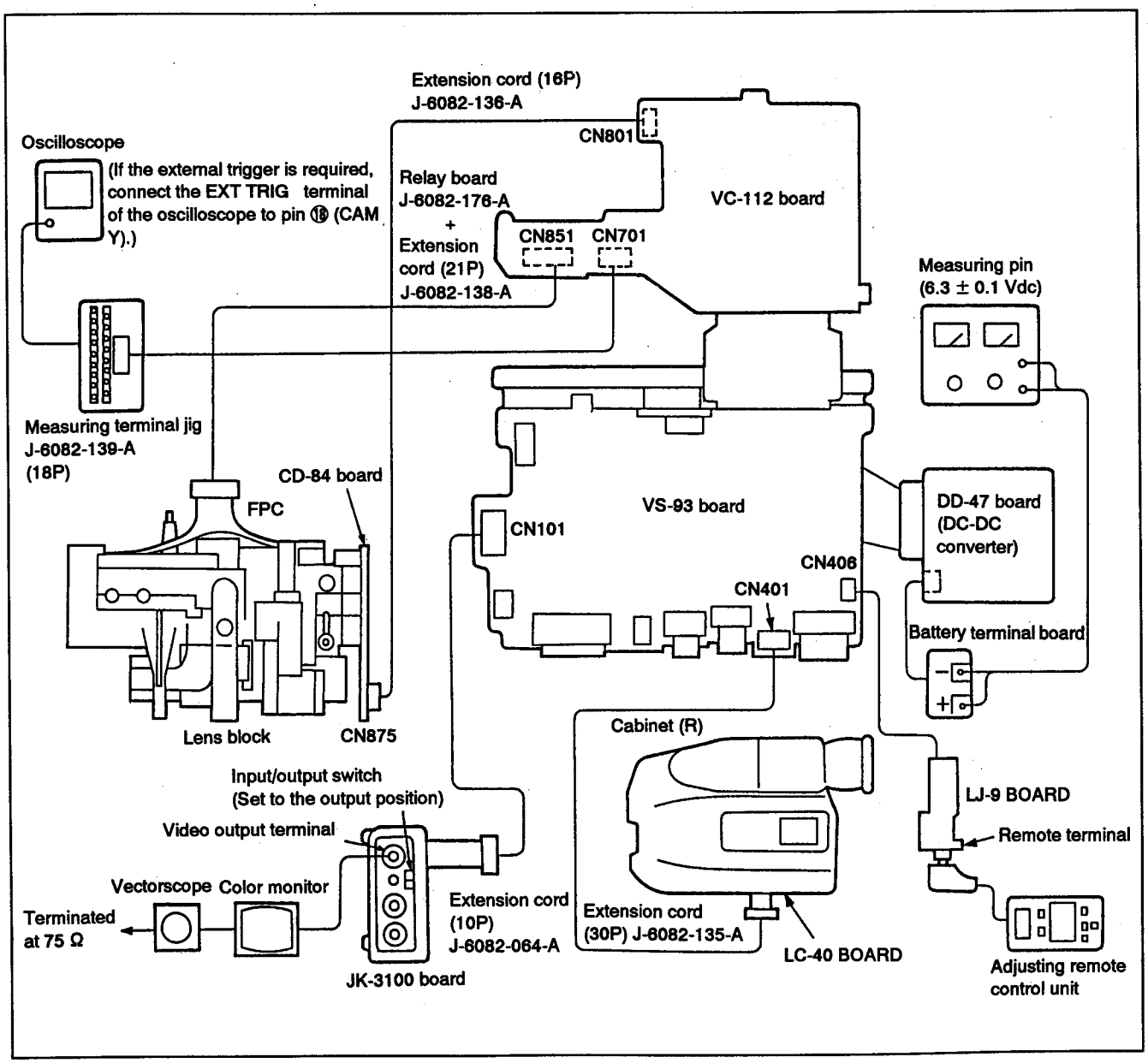


Fig. 7-3.

7-1-3. Precautions

1. Switch settings

Adjust the switches to the following positions, and perform the adjustments without inserting the tape, unless specified otherwise.

1. Camera/VTR power switch (CF-3200 board S1)·····Camera
2. Standby switch (CF-3200 board S18)····· Standby
3. Input/output switchover switch (JK-3100 board S921) ·····Output
4. LENS OPEN switch····· OPEN
5. AUTO LOCK switch (CF-3200 board S19)····· OFF
6. FOCUS button (CF-3200 board S22)·····MANUAL
7. EXPOSURE button (CF-3200 board S25)·····AUTO
8. PROGRAM AE button (CF-3200 board S20)·····NORMAL

2. Adjustment Procedure

Perform in the given order as a rule.

3. Subject

1) Color bar chart (Standard picture frame)
   Adjust the display frame as shown in Fig. 7-4. if adjustments are performed using the color bar chart. (Standard picture frame)
2) White pattern (Standard picture frame)
   Remove the color bar chart from the pattern box, and adjust the zoom lever so that the white pattern becomes the same size and is in the same position as the color bar chart (Standard picture frame).

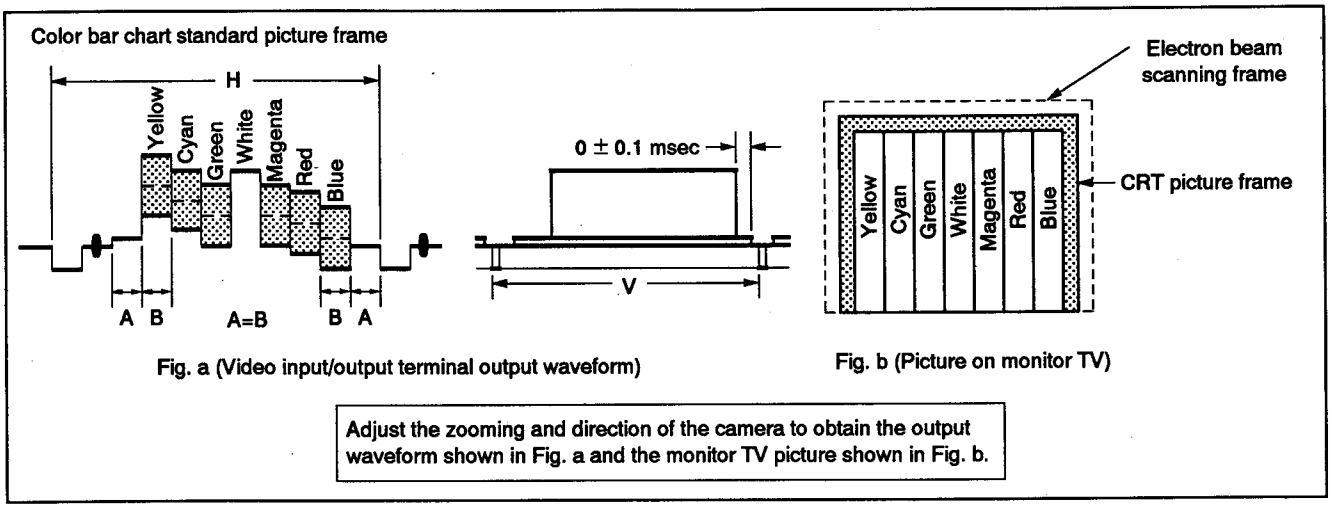


Fig. 7-4.

3) Chart for flange back adjustment
   Combine a white A0 size (1189 mm× 841 mm) paper to a black one, and make the chart shown in Fig. 7-5.

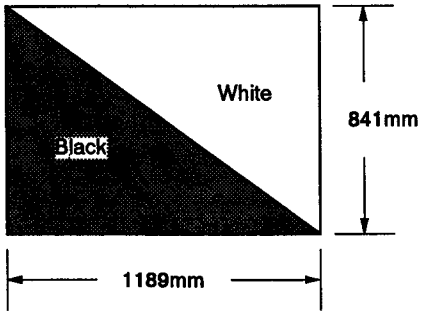


Fig. 7-5.

Note: Use the non-reflecting and non-glazing vellum paper whose size is more than A0, and make the boundary between white and black to be smoothly flat.

7-1-4. Adjusting Remote Control Unit

The camera section is adjusted by changing the constant using the coefficient of the digital signal processing calculation, or modifying the output voltage of EVR IC (VC-112 board IC702). These processes are carried out by the camera micro processor (VC-112 board IC709). This micro processor reads the data written in the non-volatile memory (VC-112 board IC712), and transmits it to the digital signal processing circuit and EVR.

The adjusting remote control unit is used for rewriting the adjustment data written in the non-volatile memory necessary for performing the adjustments.

The adjusting remote control unit uses the remote control signal line (LANC) to correspond mutually with the camera micro processor. The page, address and the up/down command of the data can be transmitted from the remote control unit to the camera micro processor. On the other hand, the page, address, and data can also be transmitted the other way round.

1. Using the adjusting remote control unit

1) Connect the adjusting remote control unit to the remote terminal (LJ-9 board J971).
2) Adjust the HOLD switch of the adjusting remote control unit to HOLD (SERVICE position).
   If it has been properly connected, the LCD on the adjusting remote control unit will show the display in Fig. 7-6.

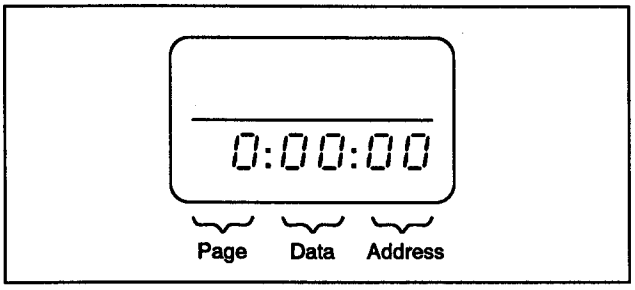


Fig. 7-6.

3) Operate the adjusting remote control unit as follows.
   - Changing the page
     The page will increase when the EDIT SEARCH+ button is pressed. It will decrease when the EDIT SEARCH– button is pressed. There are altogether 16 pages, from 0 to F.

Hexadecimal notation	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Display on LCD	0	1	2	3	4	5	6	7	8	9	A	b	c	d	E	F
Decimal notation conversion value	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Table 7-1.

   - Changing the address
     The address will increase when the FF (▶▶) button is pressed, and decrease when the REW (◀◀) button is pressed. There are altogether 256 addresses, from 00 to FF.
   - Changing the data (Data setting)
     The data will increase when the PLAY (▶) button is pressed, and decrease when the STOP (■) button is pressed.
     There are altogether 256 data, from 00 to FF.
   - Writing the adjustment data
     It is necessary to press the PAUSE button to write the adjustment data (F page, D page) in the non-volatile memory.
     (The new adjustment data will not be recorded in the non-volatile memory if this operation is not performed.)
4) Select page: 6, address: 00, and adjust the data to 01. This releases the write protect of page F, and the camera section (F page) can be adjusted.
5) After completing all adjustments, turn off the main power (6.3V) once. This can release the adjustment mode (other than page F).

2. Precautions upon using the adjusting remote control unit

The correct adjustment data may be erased at times, due to operation errors of the adjusting remote control unit. To prevent this from occurring, it is recommended that all adjustment data be recorded in the memory before beginning adjustments, and the new adjustment data be recorded in the memory after each adjustment.

7-1-5. Page F Address List

Note 1: The data listed in the adjustment data memo column are fixed values.

Note 2: The adjustment data initial values are the values after performing "Page F Data Initialization" and "Page F Data Modification". They are different from the value after performing all the adjustments.

Address	Name	Function [ ] Indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
00	ID	Set ID	00	25
01	FADER LEVEL	AE REF level modification during fader	E0	E0
02	FADER ENDTIM	The setting of the AE REF modulation time during fader	10	10
03	SI OFFSET	Carrier balance adjustment	35	
04	VSUB	CCD imager V SUB adjustment [IC702 ③]	80	
05	VPGH	CCD imager VRG adjustment [IC702 ④]	80	
06	VREF Y	Camera core Y D/A standard voltage, SYNC level adjustment [IC702 ⑤]	7B	
07	VREF C	Camera core CHROMA D/A standard voltage, BURST level adjustment [IC702 ⑥]	99	
08	HALL GAIN	Hole amplifier gain adjustment [IC702 ⑦] } HALL adjustment	47	
09	HALL OFFSET	Hole amplifier offset adjustment [IC702 ⑧] } HALL adjustment	71	
0A	E LOWLIGHT START	Low luminance intensity REF level modulation start setting	30	30
0B	REF 2V	2V standard voltage for hole element [IC702 ⑫]	68	68
0C	AD REF	Black level setting during A/D conversion, A/D off set adjustment [IC702 ⑬]	72	
0D	CORE DETH	CCD correction control	04	04
0E	CORE VTR DELAY	1HDL longitudinal setting during VTR playback	16	16
0F	CORE APCN4	Horizontal aperture setting	A5	A5
10	CORE APCN5	Vertical aperture setting	3D	3D
11	CORE EFECT	Special effect control	A8	A8
12	CORE MATR	BLUE matrix constant	27	27
13	CORE MATB	RED matrix constant	6C	6C
14	CORE BURST LEVEL	Burst flag level setting, color modulation ON/OFF Data: 2C — Adjustment mode: Normal level Data: 2E — Adjustment mode: Color modulation stopped	2C	2C
15	CORE CHROMA DLY	Y/C delay adjustment	07	07
16	CORE Y SETUP	Set up level setting	06	06
17	CORE VHAPCN	Slice and level setting of the aperture signal	17	17
18	CORE B-Y GAIN	B–Y GAIN } Color reproduction adjustments	13	
19	CORE R-Y GAIN	R–Y GAIN } Color reproduction adjustments	11	
1A	CORE R-Y HUE	R–Y HUE } Color reproduction adjustments	FF	
1B	CORE B-Y HUE	B–Y HUE } Color reproduction adjustments	FD	
1C	CS/APCCUT	Low luminance intensity aperture and chroma suppress level	22	22

Table 7-2 (1).

Address	Name	Function [ ] Indicate the adjustment voltage output terminal		Adjustment data	
				Initial value	Memo column
1D	NEXT LINE DEFECT BIT	CCD correction pattern	CCD imager correction data write	00	
1E	CCD DEFECT0	CCD correction data		00	
1F	CCD DEFECT1	CCD correction data		00	
20	CCD DEFECT2	CCD correction data		00	
21	CCD DEFECT3	CCD correction data		00	
22	CCD DEFECT4	CCD correction data		00	
23	CCD DEFECT5	CCD correction data		00	
24	CCD DEFECT6	CCD correction data		00	
25	CCD DEFECT7	CCD correction data		00	
26	CCD DEFECT8	CCD correction data		00	
27	CCD DEFECT9	CCD correction data		00	
28	CCD DEFECT10	CCD correction data		00	
29	CCD DEFECT11	CCD correction data		00	
2A	CCD DEFECT12	CCD correction data		00	
2B	CCD DEFECT13	CCD correction data		00	
2C	CCD DEFECT14	CCD correction data		00	
2D	RREF L	3200k Red standard data LSB	Auto white balance preset adjustment	72	
2E	RREF H	3200k Red standard data MSB		5F	
2F	GREF L	3200k Green standard data LSB		D4	
30	GREF H	3200k Green standard data MSB		63	
31	BREF L	3200k Blue standard data LSB		3B	
32	BREF H	3200k Blue standard data MSB		2C	
33	RCONTREF	3200k RCONT adjustment value	Pre-white balance adjustment	42	
34	BCONTREF	3200k BCONT adjustment value		4A	
35	AWB NOWM R	Red regular correction coefficient	Auto white balance adjustment	7E	
36	AWB NORM B	Blue regular correction coefficient		96	
37	AWB SHUT IN	Indoor determination shutter data		A8	A8
38	ABW SHUT OUT	Outdoor determination shutter data		A0	A0
39	AWB IRIS IN	Indoor determination hole data	IRIS IN/OUT adjustment	79	
3A	AWB IRIS OUT	Outdoor determination hole data		7F	
3B	AWB G LEVEL	High luminance section green integral level		02	02
3C	AWB G WIDTH	High luminance section green integral level range		03	03
3D	DMAT HUE	Variable linear matrix HUE coefficient	Linear matrix adjustment	00	
3E	DMAT GAIN	Variable linear matrix GAIN coefficient		00	
3F	AWB SELECT	AWB mode selection		00	00
40	AWB DIFF	Standard difference from the outdoor fixed value		0A	0A
41	AWB BOTTOM SLP R	AWB incoming frame bottom R coefficient		48	48
42	AWB BOTTOM SLP B	AWB incoming frame bottom B coefficient		78	78
43	AWB MIDDLE SLP R	AWB incoming frame middle R coefficient		60	60
44	AWB MIDDLE SLP B	AWB incoming frame middle B coefficient		40	40
45	AWB TOP SLP R	AWB incoming frame top R coefficient		66	66
46	AWB TOP SLP B	AWB incoming frame top B coefficient		18	18

Table 7-2 (2).

Address	Name	Function [ ] Indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
47	AWB KEIKO R	AWB incoming frame fluorescent light R coefficient	66	66
48	AWB KEIKO B	AWB incoming frame fluorescent light B coefficient	18	18
49	AWB BOTTOM UP	AWB incoming frame bottom upper value	C2	C2
4A	AWB BOTTOM DWN	AWB incoming frame bottom lower value	94	94
4B	AWB MIDDLE UP	AWB incoming frame middle upper value	AD	AD
4C	AWB MIDDLE DWN	AWB incoming frame middle lower value	96	96
4D	AWB TOP UP	AWB incoming frame top upper value	78	78
4E	AWB TOP DWN	AWB incoming frame top lower value	60	60
4F	AWB KEIKO	AWB incoming frame fluorescent light output lower value	6C	6C
50	AWB KEIKO DWN	AWB incoming frame fluorescent light lower value	5C	5C
51	AWB R TOP LMT	AWB incoming frame Rcont upper value	6E	6E
52	AWB R DWN LMT	AWB incoming frame Rcont lower value	20	20
53	AWB B TOP LMT	AWB incoming frame Bcont upper value	83	83
54	AWB B IN TOP	AWB incoming frame Bcont	67	67
55	AWB B IN MAX	AWB incoming frame Bcont	5C	5C
56	AWB B OUT MIN	AWB incoming frame Bcont	5C	5C
57	AWB B OUT DWN	AWB incoming frame Bcont	4A	4A
58	AWB B DWN LMT	AWB incoming frame Bcont lower value	1B	1B
59	AWB LL LMT	Low luminance intensity limiter	06	06
5A	AWB T M DIVID	AWB incoming frame upper, middle border value	5B	5B
5B	AWB B M DIVID	AWB incoming frame middle, lower border value	39	39
5C	AWB DELAY TM	AWB tracking speed Data: 01 — High speed tracking mode; 10 — Normal	10	10
5D	AWB FAST TM	AWB initial high speed tracking amount	40	40
5E	AWB OUT HYS OFF	AWB outdoor hysteresis off difference	0C	0C
5F	AWB OUT B HYS	AWB outdoor hysteresis amount	06	06
60	AWB MODE	AWB adjustment mode Data: 00 — Normal; D0 — AWB adjustment mode; F1 — All area tracking mode	00	00
61	AE REFL	Reference value (lower) for AE	00	00
62	AE REFH	Reference value (upper) for AE	18	18
63	AGC MIN	AGC MIN value (AGCREF value), IRIS level adjustment	E3	
64	AE MIML	Low luminance intensity side limiter (MAXGAIN), MAX GAIN adjustment	32	
65	AE MAXL	High luminance intensity side limiter (lower)	80	80
66	IRIS OFFSET	Iris ROM table OPEN side off set	D0	D0
67	AE KEISU	Correction coefficient during detection weighting	00	00
68	AE FUNCTION	SW for turning each AE function ON and OFF	00	00

Table 7-2 (3).

Address	Name	Function [ ] Indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
69	BL HOSEIH	Forcible back light level setting (upper)	40	40
6A	JITEISU DOWN	Constant during loop response DOWN side	30	30
6B	JITEISU UP	Constant during loop response UP side	10	10
6C	AE KNEE	KNEE setting value for AE	FF	FF
6D	ORETEN SET	Variable point due to time constant error amount	13	13
6E	OMOMIOUT	Outer frame weighting amount	40	40
6F	AFC WIDE	Coefficient required for the ANF integral loop	03	03
70	AFC GAIN	Loop gain of the flickerless loop	01	01
71	AFC LIMIL	Limiter corresponding to the error rate (Lower)	60	60
72	HIST P KEISU	Histocomp level setting P for counter light determination	20	20
73	HIST H KEISU	Histocomp level setting H for counter light determination	E0	E0
74	HIST L KEISU	Histocomp level setting L for counter light determination	90	90
75	GYKOU JITEISU	Constant during auto back light response	08	08
76	SUBN LIMIT	Limiter for counter light determination	40	40
77	FUZZY RULE1	Correction amount 1 for auto back light	90	90
78	FUZZY RULE2	Correction amount 2 for auto back light	C0	C0
79	FUZZY RULE3	Correction amount 3 for auto back light	B0	B0
7A	FUZZY RULE4	Correction amount 4 for auto back light	A0	A0
7B	FUZZY RULE5	Correction amount 5 for auto back light	70	70
7C	FUZZY RULE6	Correction amount 6 for auto back light	80	80
7D	FUZZY RULE7	Correction amount 7 for auto back light	A0	A0
7E	FUZZY RULE8	Correction amount 8 for auto back light	98	98
7F	FUZZY RULE9	Correction amount 9 for auto back light	90	90
80	FUZZY RULE10	Correction amount 10 for auto back light	78	78
81	IRIS MIN L	Iris limit value (lower)	42	42
82	IRIS MIN H	Iris limit value (upper)	02	02
83	DELTA SHUT GAIN	Shutter smoothing value setting	04	04
84	AE WAKUH	Frame data for AE detection (vertical line)	0F	0F
85	AE WAKUV	Frame data for AE detection (horizontal line)	4F	4F
86	WIDE LIMIT	ZOOM limiter WIDE (lower) } Flange back adjustment	DE	
87	WIDE LIMITH	ZOOM limiter WIDE (upper)	02	
88	TELE LIMIT	ZOOM limiter TELE (lower)	22	
89	TELE SIMITH	ZOOM limiter TELE (upper)	1D	
8A	STEP ZERO	Flange back value	90	
8B	STEP ZERO SPAN	Frange back value 2	A0	
8C	ZOOM SPD FAST	Zoom speed (fast)	60	60
8D	ZOOM SPD SUPER	Zoom speed (For adjustment)	59	59
8E	ZS INIT SLOW	Zoom speed initial value (slow)	59	59
8F	ZS INIT FAST	Zoom speed initial value (fast)	59	59
90	ZMSPD DAMIN	Zoom speed D/A MIN value	3D	3D
91	ZS K	Zoom servo coefficient K	11	11
92	ZS L	Zoom servo coefficient L	04	04

Table 7-2 (4).

<table>
<tr><th rowspan="2">Address</th><th rowspan="2">Name</th><th rowspan="2">Function
[ ] Indicate the adjustment voltage output terminal</th><th colspan="2">Adjustment data</th></tr>
<tr><th>Initial value</th><th>Memo column</th></tr>
<tr><td>93</td><td>ZP HYS</td><td>Zoom potential hysteresis</td><td>03</td><td>03</td></tr>
<tr><td>94</td><td>ZOOM SPD SLOW</td><td>Zoom speed (slow)</td><td>22</td><td>22</td></tr>
<tr><td>95</td><td>AF MD2THL</td><td>MODE2 THR</td><td>20</td><td>20</td></tr>
<tr><td>96</td><td>MAXCHG THR</td><td>MAX value renewal THR</td><td>1A</td><td>1A</td></tr>
<tr><td>97</td><td>ERR THL</td><td>Wobbling width THR</td><td>18</td><td>18</td></tr>
<tr><td>98</td><td>WOB INTV</td><td>Wobbling second interval</td><td>04</td><td>04</td></tr>
<tr><td>99</td><td>ERRPOL THR</td><td>MODE2 error possible THR</td><td>13</td><td>13</td></tr>
<tr><td>9A</td><td>MAXCHK THR</td><td>MAX CHECK THR</td><td>12</td><td>12</td></tr>
<tr><td>9B</td><td>REWOB THR</td><td>Wobbling second THR</td><td>0A</td><td>0A</td></tr>
<tr><td>9C</td><td>MODE2 INOUT</td><td>MODE2 speed switchover</td><td>8B</td><td>8B</td></tr>
<tr><td>9D</td><td>SMLWD THR</td><td>Small frame THR</td><td>0A</td><td>0A</td></tr>
<tr><td>9E</td><td>ZOOM PULSE LIMIT</td><td>Maximum zoom pulse value</td><td>C6</td><td>C6</td></tr>
<tr><td>9F</td><td>ZOOM RIZE</td><td>Zoom rise minimum speed time</td><td>0A</td><td>0A</td></tr>
<tr><td>A0</td><td>FB CURVEPEAKL</td><td>Constant for flange back adjustment</td><td>F5</td><td>F5</td></tr>
<tr><td>A1</td><td>FB CURVEPEAKH</td><td>Constant for flange back adjustment</td><td>0B</td><td>0B</td></tr>
<tr><td>A2</td><td>FB ZOOMSH</td><td>Constant for flange back adjustment</td><td>5D</td><td>5D</td></tr>
<tr><td>A3</td><td>FB ZOOMSH</td><td>Constant for flange back adjustment</td><td>06</td><td>06</td></tr>
<tr><td>A4</td><td>LIMITREST WIDE</td><td>Zoom limiter WIDE side</td><td>14</td><td>14</td></tr>
<tr><td>A5</td><td>LIMITREST TELE</td><td>Zoom limiter TELE side</td><td>0F</td><td>0F</td></tr>
<tr><td>A6</td><td>FB PEAKTHR</td><td>Constant for flange back adjustment</td><td>FF</td><td>FF</td></tr>
<tr><td>A7</td><td>FB FOCUSZERO</td><td>Constant for flange back adjustment</td><td>1C</td><td>1C</td></tr>
<tr><td>A8</td><td>DET IRIS ALT</td><td>Iris variation check THR</td><td>02</td><td>02</td></tr>
<tr><td>A9</td><td>DET AGC ALT</td><td>AGC variation check THR</td><td>02</td><td>02</td></tr>
<tr><td>AA</td><td>LIMIT INSURANCE</td><td>Focus limiter insurance value</td><td>02</td><td>02</td></tr>
<tr><td>AB</td><td>FOCUS MODE</td><td>Focus mode
<table><tr><th>Data</th><th>Adjustment mode</th></tr><tr><td>08</td><td>Zoom, Focus fixed</td></tr><tr><td>00</td><td>Normal</td></tr></table></td><td>00</td><td>00</td></tr>
<tr><td>AC</td><td>LENS ADJ MODE</td><td>Flange back adjustment mode
<table><tr><th>Data</th><th>Adjustment mode</th></tr><tr><td>00</td><td>Nomal</td></tr><tr><td>01</td><td>Flange back adjustment</td></tr></table></td><td>00</td><td>00</td></tr>
<tr><td>AD</td><td>LENS EMRG</td><td>Lens emergency</td><td>00</td><td>00</td></tr>
<tr><td>AE</td><td>NTSC PAL/H DEF DELAY</td><td>DELAY bit=0: NTSC, 1: PAL, bit4-7=CCD correction delay</td><td>20</td><td>20</td></tr>
<tr><td>AF</td><td>FT SW</td><td>DDS display mode switchover
<table><tr><th>Data</th><th>DDS display mode</th></tr><tr><td>00</td><td>Y sampling display</td></tr><tr><td>03</td><td>R–Y, B–Y display</td></tr><tr><td>40</td><td>HALL data display</td></tr><tr><td>82</td><td>R ratio display</td></tr><tr><td>83</td><td>B ratio display</td></tr><tr><td>91</td><td>R, B ratio (M) display</td></tr><tr><td>B0</td><td>Focus step display</td></tr></table></td><td>00</td><td>00</td></tr>
</table>

Table 7-2 (5).

Address	Name	Function [ ] Indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
B0	CORE OTHER	CORE MODE DATA 13 byte	12	12
B1	CORE Y GAIN	CORE FIELD DATA 0 byte	3F	3F
B2	LOW LIGHT CS	Low light chroma suppress start point	80	80
B3				
B4	E LOW LIGHT START 2	Low light REF level modulation start 2	80	80
B5	E LOW LIGHT LEVEL	Low light REF level modulation level	F0	F0
B6	ZOOM DROP 1	F-No. dropping (1) by Zoom lens	60	60
B7	ZOOM DROP 2	F-No. dropping (2) by Zoom lens	75	75
B8				
B9				
BA	AWB IN B HYS	Hysteresis of AWB indoor BLUE	04	04
BB	AWB IN R HYS	Hysteresis of AWB indoor RED	02	02
BC	AWB KAKE NORM R	ADD: 35 NORM R × 1000H	20	20
BD	AWB KAKE NORM B	ADD: 36 NORM B × 1000H	20	20
BE	MF STEP CHNGE	Coefficent of MODE 2 THR	06	06
BF	ZOOM SPEED SUPER LOW	Zoom speed (supper low)	07	07
C0	MAX CHECK NG CNT	MAX CHECK NG count	1E	1E
C1	AF CONTROL FLAG		0E	0E
C2	AE Y THR	Low light AE fluctuation THR 1	28	28
C3	AE Y MIN	Low light AE fluctuation THR 2	20	20
C4	MD2 SPD	Focus speed at MODE 2	61	61
C5	AE CHECK	Re-start up AE THR	10	10
C6	LOW CON THR	THR 1 for judging Low-contrast at MODE 2	10	10
C7	LOW CON THR2	THR 2 for judging Low-contrast at MODE 2	20	20
C8~EF		Not used		
F0		Input column of the unit ID No., etc. Not related to unit operations.	FF	
F1			FF	
F2			FF	
F3			FF	
F4			FF	
F5			FF	
F6			FF	
F7			FF	
F8			FF	
F9			FF	
FA			FF	
FB			FF	
FC			FF	
FD			FF	
FE			FF	
FF			FF	

Table 7-2 (6).

7-1-6. 6 Page, 1 Page Address List

The camera adjustment mode can be set by performing the following data settings at page: 6 or page: 1. (These page data can be set temporary, but when the main power (6.3V) is turned off, the original value (normal value) will be returned. Therefore, these adjustment modes can be released very simply by turning the main power off.)

(Example) The camera adjustment mode (1) is set by setting data: 01 to page: 6, address: 00. The F page write protect will also be released.

1. Page 6

Address	Adjustment Mode	Data	Function
00	Camera adjustment mode	01	Camera adjustment mode (1), F page write protect released
		10	Normal
		11	Camera adjustment mode (2), F page write protect released
01	Camera adjustment switch **Note:** To set this address adjustment mode, it is necessary to press the PAUSE button of the adjusting remote control unit after setting the data.	00	Normal
		01	IRIS OPEN, AGC HOLD
		03	IRIS CLOSE1, AGC HOLD
		05	IRIS CLOSE2, AGC MIN
		07	IRIS CLOSE3, AGC MAX
		09	ND0.5 SHUTTER (PAL=1/160, NTSC=1/190)
		0B	ND0.8 SHUTTER (PAL=1/320, NTSC=1/380)
		0D	AWB PRESET1: 3200K PRESET DATA take in
		0F	WB 3200K PRESET: Indoor white balance mode
		11	AWB PRESET2: Preparation of 3200K PRESET DATA take in
		13	ZOOM HUNTING1 ZOOM SPDSLOW
		15	ZOOM HUNTING2 ZOOM SPDFAST
		17	AE FB adjustment mode (IRIS: OPEN, AGC: REF, SHUTTER: 1/100 (NTSC), 1/120 (PAL))
		1D	EEPROM PRE WRITE: Page F initial data write
05	Shutter mode	00	NTSC=1/60, PAL=1/50
		15	1/2000
06	FOCUS limiter ON/OFF	00	FOCUS limiter ON (Normal)
		01	FOCUS limiter OFF
07	ZOOM limiter ON/OFF	00	ZOOM limiter ON (Normal)
		01	ZOOM limiter OFF
08	ZOOM speed SLOW/FAST	00	Normal
		01	ZOOM speed SLOW
		02	ZOOM speed FAST
		03	ZOOM speed SUPER SLOW
09 ★	COMPLEATED FLAG	00	Camera Adjustment not completed
		01	Camera adjustment completed
11 ★	ROM VERSION	01	Camera micro processor ver1
		02	Camera micro processor ver2
		03	Camera micro processor ver3
0C ★	LENS INITIAL END	00	During the initial operation of the lens
		01	Lens initial operation completed

Addresses with ★ are exclusively for reading.

Table 7-3.

2. Page 1

Address	Adjustment Mode	Data	Function
E6	VH address L		Title horizontal/vertical position (L)
E7	VH address H		Title horizontal/vertical position (H)

Table 7-4.

7-1-7. Adjustment Connector

Most of the measuring points for the camera section adjustment are concentrated on CN701 of the VC-112 board. Connect the oscilloscope and etc. via the measuring pin (J-6082-139-A). The following table lists the terminal numbers and the signal names of CN701.

Terminal Number	Signal Name	Terminal Number	Signal Name
1	D5V	2	NC
3	NC	4	CAM SI
5	NC	6	CAM SO
7	$\overline{\text{CS OPD}}$	8	$\overline{\text{CAM SCK}}$
9	$\overline{\text{CS CORE}}$	10	GND
11	IRIS OUT	12	NC
13	V SUB CHK	14	CAM C
15	PG CONT	16	GND
17	14 MHz	18	CAM Y

Table 7-5.

7-1-8. Data Processing

The calculation of the DDS display and the adjusting remote control unit display data (hexadecimal notation) are required for obtaining the adjustment data of some adjustment items. In this case, after converting the hexadecimal notation to decimal notation, calculate and convert the result to hexadecimal notation, and use it as the adjustment data. Table 7-6. indicates the hexadecimal notation-the decimal notation calculation table.

Hexadecimal notation-Decimal notation

② ↓

The lower digits of the hexadecimal notation / The upper digits of the hexadecimal notation	0	1	2	3	4	5	6	7	8	9	A (A)	B (b)	C (c)	D (d)	E (E)	F (F)
0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
3	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
4	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
5	80	80	82	83	84	85	86	87	88	89	90	91	92	93	94	95
6	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
7	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
8	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
9	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
A (A)	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
① → B (b)	176	177	178	179	180	180	182	183	184	185	186	187	188	189	190	191
C (c)	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
D (d)	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
E (E)	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
F (F)	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

Note: ( ) indicate the adjusting remote control unit display.

(Example) In the case that the DDS display and the adjusting remote control unit display are BD (b d).
As the upper digit of the hexadecimal notation is B (b), and the lower digit is D (d), the intersection "189" of the ① and ② in the above table is the decimal notation to be calculated.

Table 7-6.

7-2. CAMERA SYSTEM ADJUSTMENT

1. Power Supply Voltage Check (DD-47 board)

Subject	Option
Measuring instrument	Digital voltmeter
D5V check	
Measurement point	Pins ⑦ and ⑧ of W401
Specified value	4.91 ± 0.1 Vdc
D4V check	
Measurement point	Pin ④ of W401
Specified value	4.06 ± 0.1 Vdc
CAM 5V check	
Measurement point	Pins ⑨ and ⑩ of W401
Specified value	4.89 ± 0.15 Vdc
CAM 15V check	
Measurement point	Pin ⑫ of W401
Specified value	15.09 ± 0.3 Vdc
CAM –9V check	
Measurement point	Pin ⑪ of W401
Specified value	–8.8 ± 0.7 Vdc

Checking method:

1) Check that each power supply voltage satisfies the specified value.

2. Page F Data Initialization

Note: It is necessary to perform all adjustments of the camera section from the beginning again if the data of page F has been initialized.

Initializing method:

1) Check that the data of page: 6, address: 09 is 00.
   (Display indicating that page F data can be initialized)
2) Check that the data of page: 6, address: 01 is 00.
3) Set data: 1D to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Page F data initialization execution.
   The data of all addresses of page F will be initialized.)
4) Check that the data of page: 6, address: 09 is 01.
   (Displays that the initialization of page F data has been completed)
5) Set data: 00 to page: 6, address: 01. and press the PAUSE button of the adjusting remote control unit.
   (Releases the page F data initialization mode)
6) After performing "Page F data modification", perform all the adjustments of the camera section (page F).

3. Page F Data Modification

The data (initial data) that is automatically written on page F after the initialization of the page F data will differ according to some camera micro processor versions. Change the data by manual input, and arrange it.

Note: When changing the data, to write the data to the non-volatile memory, press the PAUSE button of the adjusting remote control unit every time the new data is set.

Address	Data
00 (ID)	25
0A (E LOWLIGHT START)	30
0F (CORE APCN 4)	A5
10 (CORE APCN 5)	3D
11 (CORE EFFECT)	A8
12 (CORE MAT R)	27
13 (CORE MTT B)	6C
15 (CORE CHROMA DLY)	07
17 (CORE VHAPCN)	17
41 (AWB BOTTOM SLP R)	48
42 (AWB BOTTOM SLP B)	78
43 (AWB MIDDLE SLP R)	60
44 (AWB MIDDLE SLP B)	40
45 (AWB TOP SLP R)	66
46 (AWB TOP SLP B)	18
49 (AWB BOTTOM UP)	C2
4A (AWB BOTTOM DWN)	94
4B (AWB MIDDLE UP)	AD
4C (AWB MIDDLE DWN)	96
4D (AWB TOP UP)	78
4E (AWB TOP DWN)	60
51 (AWB R TOP LMT)	6E
58 (AWB B DWN LMT)	1B
5B (AWB M DIVID)	39
62 (AE REF H)	18
AE (NTSC PAL/H DEF DELAY)	20
B0 (CORE OTHER)	12
B2 (LOW LIGHT CS)	80
BD (AWB KAKE NORM B)	20

[Distinguishing the Camera Micro Computer (IC709) Versions]

Each version can be distinguished by looking at the part name of the camera micro processor or the data of page: 6, address: 11.

Version	Part Name	Page: 6 Address: 11
Ver.2	CXP80624-285R	02
Ver.3	CXP80624-298R	03

4. 28 MHz Original Oscillation Adjustment (VC-112 board)

Subject	Not required
Measurement Point	Pin ⑰ of IC706 (14 MHz)
Measuring Instrument	Frequency counter
Adjusting Element	CT801
Specified Value	14318181 ± 71 Hz

Adjusting method:

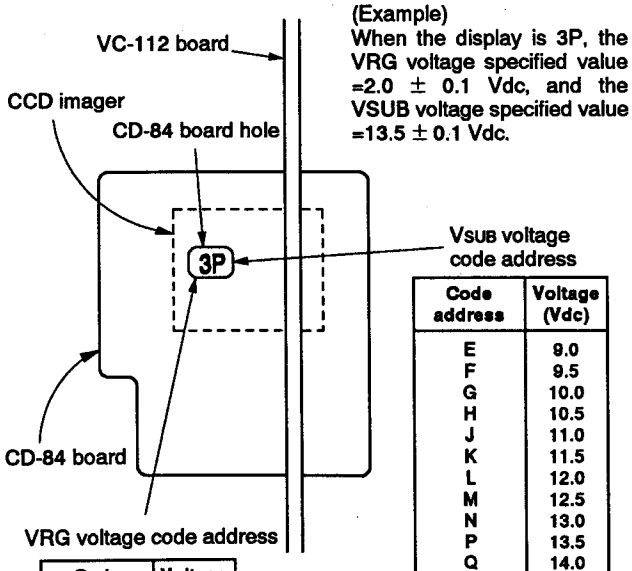
1) Use CT801 to adjust the oscillation frequency to 14318181 ± 71 Hz.

5. V SUB Adjustment (VC-112 board)

Subject	Not required
Measurement Point	Pin ⑬ of CN701 (V SUB CHK)
Measuring Instrument	Digital voltmeter
Adjustment Page	F
Adjustment Address	04 (V SUB)
Specified Value	(Imager display voltage) ± 0.1 Vdc

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Change the data of page: F, address: 04, and adjust the voltage of pin ⑬ of CN701 to (imager display voltage) ± 0.1 Vdc.
3) Press the PAUSE button of the adjusting remote control unit.


(Example)
When the display is 3P, the VRG voltage specified value =2.0 ± 0.1 Vdc, and the VSUB voltage specified value =13.5 ± 0.1 Vdc.
VC-112 board
CCD imager
CD-84 board hole
3P
VSUB voltage code address
CD-84 board
VRG voltage code address

Code address	Voltage (Vdc)
1	1.0
2	1.5
3	2.0
4	2.5
5	3.0
6	3.5
7	4.0

Code address	Voltage (Vdc)
E	9.0
F	9.5
G	10.0
H	10.5
J	11.0
K	11.5
L	12.0
M	12.5
N	13.0
P	13.5
Q	14.0
R	14.5
S	15.0
T	15.5
U	16.0
V	16.5
W	17.0
X	17.5
Y	18.0
Z	18.5

Fig. 7-7.

6. VRG Adjustment (VC-112 board)

Subject	Not required
Measurement Point	Pin ⑮ of CN701 (PG CONT)
Measuring Instrument	Digital voltmeter
Adjustment Page	F
Adjustment Address	05 (VRG)
Specified Value	(Imager display voltage) ± 0.1 Vdc

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Change the data of page: F, address: 05, and adjust the voltage of pin ⑮ of CN701 to (imager display voltage) ± 0.1 Vdc.
3) Press the PAUSE button of the adjusting remote control unit.

7. CCD Imager Correction Data Write

Subject	Not required
Adjustment Page	F
Adjustment	1D to 2C (CCD-DEFECT)

Perform CCD imager correction data write in the following cases.

1. When the CCD imager has been replaced
2. The ocassion of exchaning a camera micro processor or EEPROM (IC712).
3. When the page F data has been initialized

In the case of 1, as the correction data is not required for the CCD imager for repair, adjust all data of addresses 1D to 2C to "00".

In the case of 2 and 3, write the correction data attached to the shield case of DD-47 board to addresses 1D to 2C.

If the correction data are not attached, adjust all data of addresses 1D to 2C to "00".

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Write the correction data to page: F, addresses: 1D to 2C.
   Note: To perform write to the non-volatile memory, press the PAUSE button of the adjusting remote control unit before changing addresses.

Processing after completing adjustments

1) If the CCD imager has been replaced, remove the old correction data label attached on the shield case (UPPER) of DD-47 board.

8. HALL Adjustment

Subject	Not required
Measurement Point	DDS display of EVF or monitor TV
Measuring Instrument	
Adjustment Page	F
Adjustment Address	08 (HALL GAIN) 09 (HALL OFFSET)
Specified Value	31 to 35 during IRIS OPEN B1 to B5 during IRIS CLOSE

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Set data: 40 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (HALL output display mode setting)
3) Set data: 03 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS CLOSE mode setting)
4) Set data: 40 to page: F, address: 08, and press the PAUSE button of the adjusting remote control unit.
5) Read the DDS display data (the bottom two digits of the display data at the bottom right of the EVF or the monitor TV display), and set to W_2.
6) Set data: 30 to page: F, address: 08, and press the PAUSE button of the adjusting remote control unit.
7) Read the DDS display data, and set to W_1.
8) Set data: 01 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS OPEN mode setting)
9) Read the DDS display data, and set to K_1.
10) Set data: 40 to page: F, address: 08, and press the PAUSE button.
11) Read the DDS display data, and set to K_2.
12) Convert W_1, W_2, K_1, K_2 to decimal notation, and obtain W_1', W_2', K_1', K_2'. (Refer to Table 7-6. "Hexadecimal notation-decimal notation conversion table".)
13) Calculate X_1' using the following equations (decimal notation calculation).
    $A' = W_2' + K_1' - W_1' - K_2'$ ·····Equation 1
    $B' = W_1' - K_1'$ ·····Equation 2
    $X1' = \frac{2048 + (48 \times A') - (16 \times B')}{A'}$ ·····Equation 3
14) Convert X_1' to hexadecimal notation, and obtain X_1.
    (Round off to one decimal place)
15) Set data: X_1 to page: F, address: 08, and press the PAUSE button of the adjusting remote control unit.
16) Change the data of page: F, address: 09, and adjust the DDS display data to "33".
17) Press the PAUSE button of the adjusting remote control unit.
18) Set data: 03 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
    (IRIS CLOSE mode setting)
19) Read the DDS display data, and set to W_0. If W_0 lies within the "B1" to "B5" range, perform "Processing after completing adjustments". If it lies outside the range, perform the following adjustments.
20) Convert W_0 to hexadecimal notation, and obtain W_0'.
21) Calculate X_2' using the following equations (decimal notation calculation).
    $C' = W_0' - B' - 51$ ·····Equation 4
    $X_2' = \frac{(128 - B') \times (X_1' - 48) + 48 \times C'}{C'}$ ·····Equation 5
    (X_1' and B' are values obtained from equations 2 and3)
22) Convert X_2' to hexadecimal notation and obtain X_2.
    (Round off to one decimal place)
23) Set data X_2 to page: F, address: 08, and press the PAUSE button of the adjusting remote control unit.
24) Change the data of page: F, address: 09, and adjust the DDS display data to "B3".
25) Press the PAUSE button of the adjusting remote control unit.
26) Set data: 01 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
    (IRIS OPEN mode setting)
27) Check that the DDS display data lies within the "31" to "35" range.

Processing after Completing Adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS NORMAL mode setting)

9. Flange Back Adjustment

Subject	Chart for flange back adjustment (1998 ± 5mm from the front side of the lens Luminance: 300 ± 50 lux)
Measurement Point	Check the operations on the TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	86 (WIDE LIMIT), 87 (WIDE LIMIT H), 88 (TELE LIMIT), 89 (TELE LIMIT H), 8A (STEP ZERO), 8B (STEP ZERO SPAN)

Adjusting method:

1) Turn the auto focus off.
2) Adjust the focus using the focus knob.
3) Check that the flange back adjustment chart center and the exposure display center coincide at both zoom lens TELE end and WIDE end.
4) Release the protect.
   Page: 6, address: 00, data: 01
5) Check that the data of page: 6, address: 09 is 00.
   (Flange back adjustment possible display)
6) Check that the page: F, address: 86 to 8B data is at the initial value. (Refer to Table 7-2. "Page F address list")
7) Set data: 01 to page: F, address: AC.
   (This causes automatic adjustment to be performed. Adjustments are performed at the zoom lens TELE end first, and then at the WIDE end. The adjustment data is automatically input to page: F, addresses: 86 to 8B.)
8) Check that the data of page: 6, address: 09 is 01.
   (Display indicating flange back adjustment completion)

Processing after completing adjustments

1) Set data: 00 to page: F, address: AC.
2) Turn off the main power supply (6.3V).

10. Flange Back Check

Subject	Siemens star (2m (or 1.4m) from the front of the lens)
Measurement Point	DDS display of EVF or TV monitor
Measuring Instrument	
Specified Value	$D_2=D_1 \pm 3$

Checking method:

1) Set data: 11 to page: 6, address: 00. (Camera adjustment mode 2)
2) Set data: B0 to page: F, address: AF. (Focus step display mode)
3) Place the Siemens star 2m (or 1.4m) from the front of the lens.
4) Adjust the EXPOSURE knob to set the lens full apearture. At this time, adjust the illumination on the Siemens star or place a ND filter over the lens, and confirm that the proper image is displayed on the monitor TV screen.
5) Turn off the auto-focus.
6) Shoot the Siemens star with the zoom TELE end.
7) Rotate the focus ring, and adjust the focus.
8) Adjust to the zoom WIDE end.
9) Read the focus step value (4 digits) displayed on the TV monitor, and take the value as D_1.
10) Rotate the focus ring, and adjust the focus.
    Read the focus step value here, and take the value as D_2.
11) Check that $D_2=D_1 \pm 3$.

Process after checking

1) Set data: 00 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.

11. SYNC Level Adjustment (VC-112 board)

Subject	Not required
Measurement Point	Pin ⑱ of CN701 (CAM Y)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	06 (VREF-Y)
Specified Value	A=140 ± 5 mV

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Set data: 05 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS CLOSE mode setting)
3) Change the data of page: F, address: 06, and adjust so that the SYNC level (A) becomes the specified value.
4) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Release of IRIS CLOSE mode)

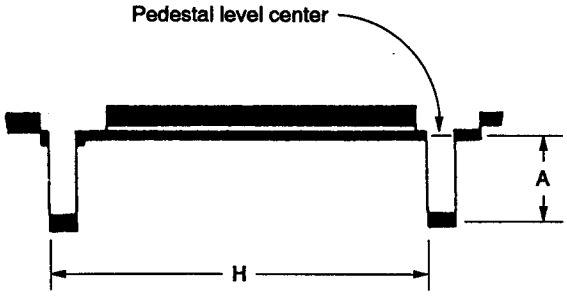


Fig. 7-8.

12. BURST Level Adjustment (VC-112 board)

Subject	Not required
Measurement Point	Pin ⑭ of CN701 (CAM C)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	07 (VREF-C)
Specified Value	A=140 ± 5 mVp-p

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Set data: 05 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS CLOSE mode setting)
3) Change the data of page: F, address: 07, and adjust so that the burst level (A) becomes the specified value.
4) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Release of IRIS CLOSE mode)

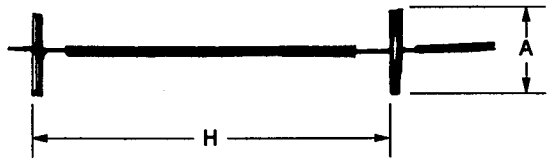


Fig. 7-9.

13. A/D Offset Adjustment

Subject	Not required
Measurement Point	DDS display on the EVF or the TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	0C (AD REF)
Specified Value	46 to 47

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Set data: 05 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS CLOSE AGC MIN mode setting)
3) Set data: 00 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (Y sampling output mode setting)
4) Set data: 35 to page: 1, address: E6.
   (Setting 1 of the sampling position)
5) Set data: 6D to page: 1, address: E7.
   (Setting 2 of the sampling position)
6) Change the data of page: F, address: 0C, and adjust the average value of the DDS display (the bottom two digits of the display data at the bottom right of the EVF or the TV monitor display) to 46 to 47.
   (Set the data of address 0C to the maximum value satisfying the specification.)
7) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Turn the main power supply (6.3V) off.

14. Carrier Balance Adjustment

Subject	Not required
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Page	F
Adjustment Address	03 (SI OFFSET)
Specified Value	The center of the black luminance point should lie within the 1 ϕ circle whose center is the principle point.

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01.
2) Set data: 07 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS CLOSE, AGC MAX mode setting)
3) Change the data of page: F, address: 03, and adjust so that the center of the black luminance point coincides with the principle point.
4) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS NORMAL mode setting)

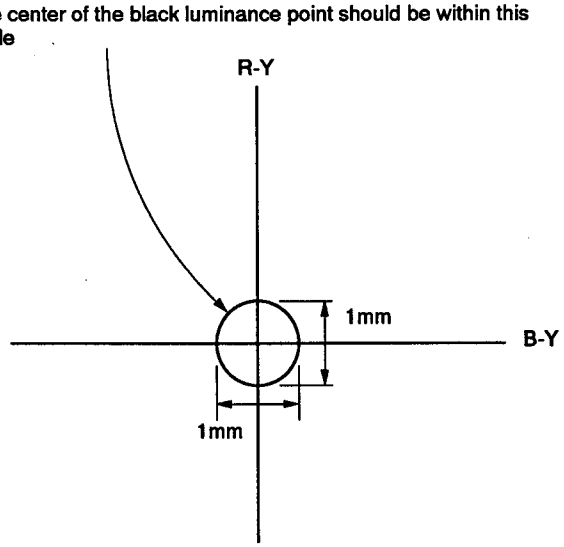


Fig. 7-10.

15. Picture Frame Setting

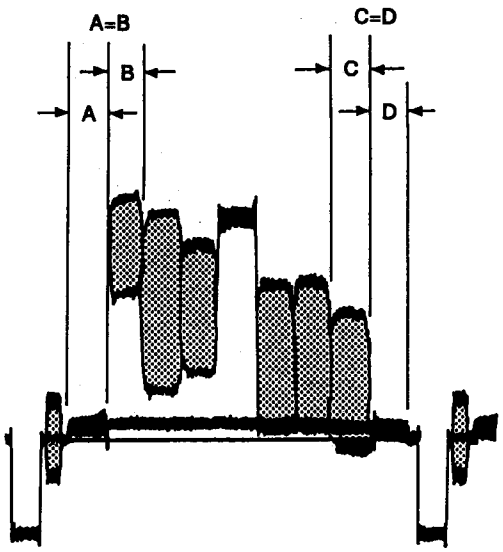
Subject	Color bar chart standard picture frame
Measurement Point	Video output terminal
Measuring Instrument	Oscilloscope and TV monitor.
Specified Value	A=B, C=D, t=0 ± 0.1 msec

Setting method:

1) Turn the auto focus off.
2) Adjust the focus using the focus knob.
3) Adjust the zoom and the camera direction, and set to the specified position.
4) Mark the position of the picture frame on the monitor display, and adjust the picture frame to this position in following adjustments using "color bar chart standard picture frame" and "white pattern standard picture frame".

Check on the oscilloscope

1. horizontal period



2. Vertical period

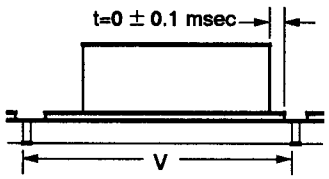


Fig. 7-11.

Check on the TV monitor

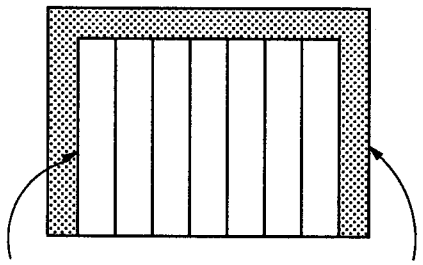


Fig. 7-12.

16. IRIS Level Adjustment (VC-112 board)

Subject	Color bar standard picture frame
Measurement Point	Pin ⑪ of CN701 (IRIS OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	63 (AGC MIN)
Specified Value	A=200 ± 5 mV

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Change the data of page: F, address: 63, and adjust so that the IRIS OUT signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

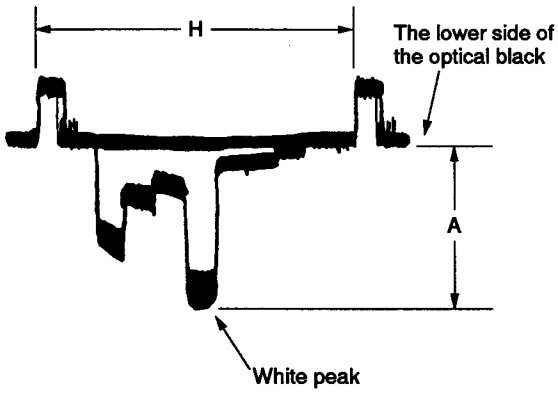


Fig. 7-13.

17. MAX GAIN Adjustment (VC-112 board)

Subject	Color bar standard picture frame
Filter	ND filter 1.0 (2 sheets) and 0.4 (1 sheet), 0.1 (1 sheet)
Measurement Point	Pin ⑱ of CN701 (CAM Y)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	64 (AE MIN L)
Specified Value	A=180 ± 5 mV

Adjusting method:

1) Place the ND filter 2.5 (1.0+1.0+0.4+0.1) on the lens.
2) Release the protect.
   Page: 6, address: 00, data: 01
2) Change the data of page: F, address: 64, and adjust so that the CAM Y signal level (A) becomes the specified value.
4) Press the PAUSE button of the adjusting remote control unit.

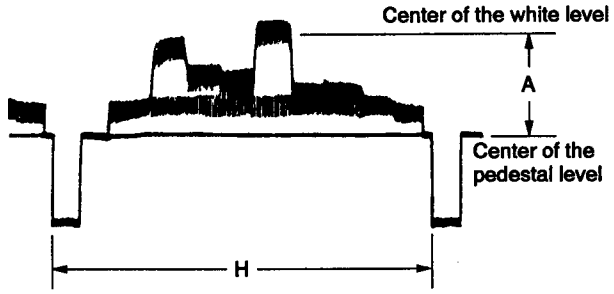


Fig. 7-14.

18. IRIS IN/OUT Adjustment

Subject	White pattern standard picture frame
Measurement Point	DDS display of the EVF or TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	39 (AWB IRIS IN) 3A (AWB IRIS OUT)

Adjusting method:

1) Set data: 11 to page: 6, address: 00.
   (Camera adjustment mode 2 setting)
2) Set data: 40 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (HALL data display)
3) Set data: 0B to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (ND0.8 shutter mode setting)
4) Read the DDS display data (the bottom two digits of the display data at the bottom right of the EVF or the TV monitor), and set to D_{39}.
5) Set data: D_{39} to page: F, address: 39, and press the PAUSE button of the adjusting remote control unit.
6) Set data: 09 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (ND0.5 shutter mode setting)
7) Read the DDS display data and set to D_{3A}.
8) Set data: D_{3A} to page: F, address: 3A, and press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Release of the ND0.5 shutter mode)

19. Pre-white Balance Adjustment

Subject	White pattern standard picture frame
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Page	F
Adjustment Address	33 (R CONT REF), 34 (B CONT REF)
Specified Value	The center of the white luminance point should lie within the circle with a diameter of 1mm and whose center is the principle point

Adjusting method:

1) Set data: 0F to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (WB 3200K preset mode setting)
2) Set data: 11 to page: 6, address: 00.
   (Camera adjustment mode 2 setting)
3) Change the data of addresses:33 and 34 of page: F alternately, and coincide the white luminance point to the principle point.
   Note: Be sure to press the PAUSE button of the adjusting remote control unit before changing the addresses. If not, the new data will not written to the memory.
4) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Release of the preset mode)
2) Set data: 10 to page: 6, address: 00.
   (Protect mode setting)

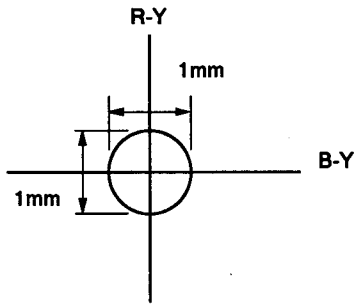


Fig. 7-15.

20. Color Reproduction Adjustment

Subject	Color bar chart standard picture frame
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Page	F
Adjustment Address	18 (CORE B–Y GAIN), 19 (CORE R–Y GAIN), 1A (CORE R–Y HUE), 1B (CORE B–Y HUE)
Specified Value	All color luminance points should settle within each color reproduction frame.

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Set data: 0F to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Indoor white balance mode setting)
3) Adjust the GAIN and PHASE of the vectorscope, and adjust the burst luminance point to the burst position of the color reproduction frame.
4) Change the data of addresses 18 to 1B of page: F, and settle each color luminance point in each color reproduction frame.
   Note: Be sure to press the PAUSE button of the adjusting remote control unit before changing the addresses.
   If not, the new data will not be written to the memory.
5) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01 and press the PAUSE button of the adjustment remote control unit.
   (Release of the adjustment mode)
2) Set data: 10 to page: 6, address: 00.
   (Protect mode setting)

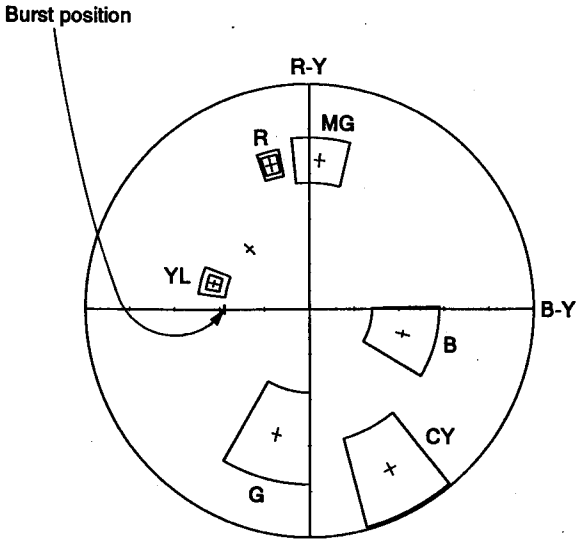


Fig. 7-16.

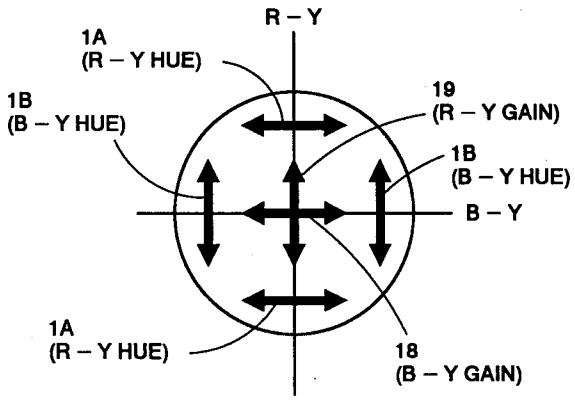


Fig. 7-17. Direction of the Movements of the Adjustment Address and Luminance Point

21. Auto White Balance Preset Adjustment

Subject	White pattern standard picture frame
Adjustment Page	F
Adjustment Address	2D (R REF L), 2E (R REF H), 2F (G REF L), 30 (G REF H), 31 (B REF L), 32 (B REF H)

Adjusting method:

1) Turn the power of the unit OFF/ON.
2) Check that the data of page: 6, address: 09 is 00.
   (Auto white balance preset adjustment possible display)
3) Set data: 11 to page: 6, address: 00.
   (Camera adjustment mode 2 setting)
5) Set data: 11 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (3200K preset data take in preparation mode)
6) Set data: 0D to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (When the 3200K preset data is taken in, the data will be automatically input to addresses 2D to 32 of page F.)
7) Check that the data of page: 6, address: 09 is 01.
   (Auto white balance preset adjustment completion display)

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Release of the auto white balance preset mode)
2) Set data: 10 to page: 6, address: 00.
   (Release of camera adjustment mode 2)

22. Auto White Balance Adjustment

Subject	White pattern standard picture frame
Filter	Filter C14 for color temperature correction
Measurement Point	Check with the DDS display on the EVF or TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	35 (AWB NORM R) 36 (AWB NORM B)
Specified Value	R ratio 2A80 ± 40 B ratio 5A80 ± 40

Adjusting method:

1) Place the C14 filter for color temperature correction on the lens.
2) Set data: 11 to page: 6, address: 00.
   (Camera adjustment mode 2 setting)
3) Set data: D0 to page: F, address: 60, and press the PAUSE button of the adjusting remote control unit.
   (Auto white balance adjustment mode setting)
4) Set data: 82 to page: F, address: AF.
   (R ratio display mode setting)
5) Change the data of page: F, address: 35, and adjust the average value of the DDS display data (the display data at the bottom right of the EVF or the TV monitor) to 2A80 ± 40.
6) Press the PAUSE button of the adjusting remote control unit.
7) Set data: 83 to page: F, address: AF.
   (B ratio display mode setting)
8) Change the data of page: F, address: 36, and adjust the average value of the DDS display data to 5A80 ± 40.
9) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: F, address: 60, and press the PAUSE button of the adjusting remote control unit.
   (Release of the white balance adjustment mode)
2) Set data: 10 to page: 6, address: 00.
   (Release of camera adjustment mode 2)

23. White Balance Check

Subject	White pattern standard picture frame
Filter	Filter C14 for color temperature correction ND filter 1.0 and 0.3
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Specified Value	Fig. 7-18. A to C

Checking method:

1) Check that the lens is not covered with either filter.
2) Set data: 11 to page: 6, address: 00.
   (Camera adjustment mode 2 setting)
3) Set data: 0F to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Indoor white balance mode setting)
4) Check that the center of the white luminance point is within the circle shown in Fig. 7-18.A.
   (Indoor white balance check)
5) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Auto white balance mode setting)
6) Set data: 01 to page: F, address: 5C, and press the PAUSE button of the adjusting remote control unit.
   (Auto white balance high speed tracking mode setting)
7) Check that the center of the white luminance point is within the circle shown in Fig. 7-18. A.
8) Place the C14 filter on the lens.
9) Check that the center of the white luminance point settles in the circle shown in Fig. 7-18. B.
   (Auto white balance outdoor mode check)
10) Remove the C14 filter, and place the ND filter 1.3 (1.0+0.3) on the lens.
11) Check that the center of the white luminance point settles in the circle shown in Fig. 7-18. C.
    (Auto white balance outdoor mode check)

Processing after completing adjustments

1) Set data: 10 to page: F, address: 5C, and press the PAUSE button of the adjusting remote control unit.
   (Release of the auto white balance fast tracking mode)
2) Set data: 10 to page: 6, address: 00.
   (Release of camera adjustment mode 2)
3) Set data: 00 to page: 6, address: 01, and press the PAUSE button.

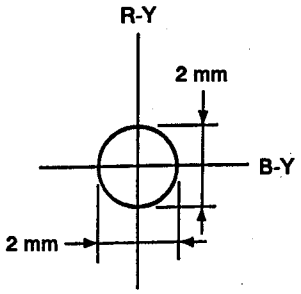


Fig. 7-18. A

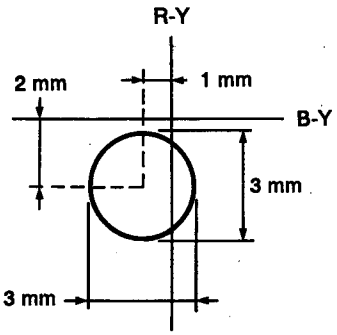


Fig. 7-18. B

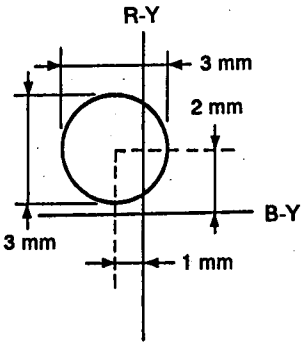


Fig. 7-18. C

24. Linear Matrix Adjustment

Subject	Color bar standard picture frame
Filter	Filter C14 for color temperature correction
Measurement Point	DDS display on the EVF or TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	3D (DMAT HUE) 3E (DMAT GAIN)

Note 1: Check that position that was set in the color bar chart picture frame "14. Picture Frame Setting" is maintained, before beginning adjustments.

Adjusting method:

1) Remove the filter C14 for color temperature correction.
2) Release the protect.
   Page: 6, address: 00, data: 01
3) Color bar data sampling mode setting
   1. Set data: F1 to page: F, address: 60, and press the PAUSE button of the adjusting remote control unit.
   2. Set data: 2E to page: F, address: 14, and press the PAUSE button of the adjusting remote control unit.

   (Check that the colors on the monitor display at the color modulation stop mode have disappeared)
4) Specifying the Yellow position
   1. Set data: C9 to page: 1, address: E6.
   2. Set data: B6 to page: 1, address: E7.
5) Set data: 03 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (R–Y, B–Y data display mode setting)
6) Read the average value of the DDS display data (Note 2), and set to Y_1.
7) Specifying the Red position
   1. Set data: 59 to page: 1, address: E6.
   2. Set data: 6D to page: 1, address: E7.
8) Select page: F and read the average value of the DDS display data (Note 3), and set to R_1.
9) Place the filter C14 for color temperature correction on the lens. (Ensure that the picture frame of the chart does not shift at this time.)
10) Specifying the yellow position.
    1. Set data: C9 to page: 1, address: E6.
    2. Set data: B6 to page: 1, address: E7.
11) Select page: F and read the average value of the DDS display data (Note 2), and set to Y_2.
12) Specifying the Red position
    1. Set data: 59 to page: 1, address: E6.
    2. Set data: 6D to page: 1, address: E7.
13) Select page: F and read the average value of the DDS display data (Note 3), and set to R_2.
14) Convert Y_1, R_1, Y_2, R_2 to decimal notation to obtain Y_1', R_1', Y_2' and R_2'.
    (Refer to Table 7-6. "Hexadecimal notation-decimal notation conversion table")
15) Calculate X_1' from the following equation (decimal notation calculation).
    $X_1' = Y_2' - Y_1'$
16) Calculate D_{3D} from the following table
    (D_{3D} is hexadecimal notation)

X_1' value	D_{3D}
$-1 \leqq X_1' \leqq 1$	F0
$X_1' > 1$	F1
$X_1' < -1$	FF

17) Set data: D_{3D} to page: F, address: 3D, and press the PAUSE button of the adjusting remote control unit.
18) Calculate X_2' from the following equation (decimal notation calculation).
    $X_2' = R_2' - R_1'$
19) Calculate D_{3E} from the following table.

X_2' value	D_{3E}
$X_2' \geqq 0$	00
$0 > X_2' \geqq -1$	01
$-1 > X_2'$	02

20) Set data: D_{3E} to page: F, address: 3E, and press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: F, address: 60, and press the PAUSE button of the adjusting remote control unit.
   (Release of the sampling mode)
2) Set data: 2C to page: F, address: 14, and press the PAUSE button of the adjusting remote control unit.
   (Color modulation ON mode setting)
3) Set data: 00 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (Release of the R–Y, B–Y data display mode)
4) Turn the main power supply (6.3V) off.

Note 2: The right two digits of the display data at the bottom right of the EVF or monitor TV.

Note 3: The left two digits of the display data at the bottom right of the EVF or monitor TV.

25. VIDEO OUT Level Check

Subject	Color bar chart standard picture frame
Measurement Point	Video output terminal (Terminated at 75 Ω)
Measuring Instrument	Oscilloscope
Specified Value	Y level=680 ± 50 mV SYNC level=285 ± 20 mV BURST level=285 ± 40 mVp-p

Checking method:

1) Check that the Y level, SYNC level and BURST level satisfy the specified values.

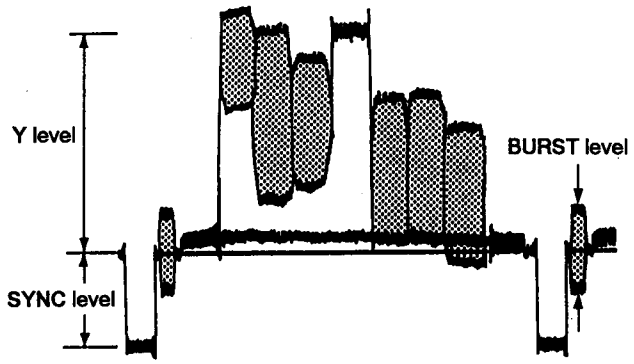


Fig. 7-19.

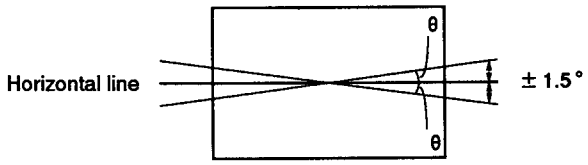
7-3. ELECTRONIC VIEWFINDER SYSTEM ADJUSTMENTS

7-3-1. Horizontal Slant Adjustment

Model	Playback
Signal	Alignment tape: For checking operations (WR5-5NSP) Monoscope section
Specified Value	Refer to Fig. 7-21.

Adjusting method:

1) Adjust RV504 (BRIGHT) so that the CRT can be seen easily and clearly.
2) Loosen the DY (deflection yoke) tightening nut.
3) Rotate DY, and adjust the image so that it is horizontal.
4) Tighten the DY tightening nut.
   (Do not tighten it too tightly.)



Specified value: The image should be within ± 1.5° of the horizontal line.

Fig. 7-21.

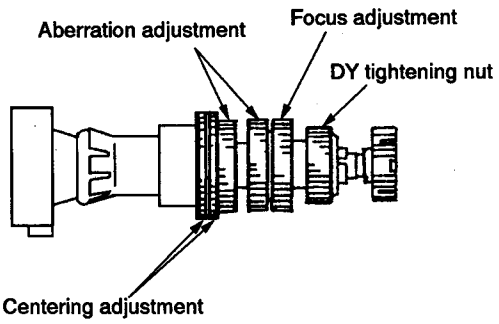


Fig. 7-22.

7-3-2. Centering Adjustment

Model	Playback
Signal	Alignment tape: For checking operations (WR5-5NSP) Monoscope section
Specified Value	Refer to Fig. 7-23.

Adjusting method:

1) Use the centering adjustment ring and adjust so that the left, right, top, and bottom sides of the display are uniform. (Refer to Fig. 7-22.)

   Note: As the centering position changes due to earth magnetism, rotate it 360 ° in the horizontal direction, and adjust with the center section of the modifying position.

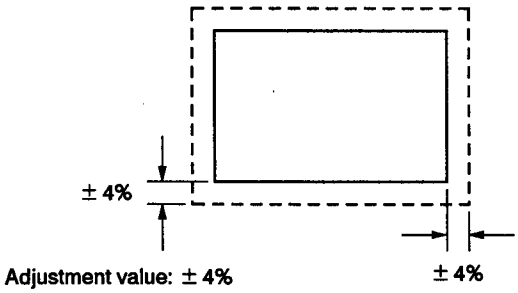


Fig. 7-23.

7-3-3. Focus Adjustment

Model	Playback
Signal	Alignment tape: For checking operations (WR5-5NSP) Monoscope section

Adjusting method:

1) Adjust the focus ring to obtain the optimum focus. (Refer to Fig. 7-22.)

7-3-4. Aberration Adjustment

Model	E-E
Signal	Dot pattern
Specified Value	Refer to Fig. 7-24.

Adjusting method:

1) Adjust the aberration adjustment ring so that the tracing of the dot becomes less than twice the diameter of the dot, or the fan aberration becomes less than the diameter of the dot.
2) If the centering becomes displaced here, perform the centering adjustment from the beginning again.

Fig. 7-24.

7-3-5. Horizontal Oscillation Frequency Adjustment (VF-42 board)

Model	Playback
Signal	Alignment tape: For checking operations (WR5-5NSP)
Measurement Point	Positive pole terminal of C516
Measuring Instrument	Digital voltmeter or oscilloscope (DC range)
Adjustment Element	RV501
Specified Value	2.60 ± 0.05 Vdc

Adjusting method:

1) Adjust to 2.60 ± 0.05 Vdc using RV501.

7-3-6. Horizontal Amplitude Adjustment (VF-42 board)

Model	Playback
Signal	Alignment tape: For checking operations (WR5-5NSP) Monoscope section
Adjusting Element	C504
Specified Value	6 ± 2%

Adjusting method:

1) Rotate RV502, and adjust the top and bottom sides of the monoscope image to the top and bottom edges of the display.
2) Rotate RV504 so that the brightness is the normal level.
3) Adjust the pattern (A) of the H size adjustment capacitor (C504) to "short" or "open", so that the horizontal direction over scan becomes 6 ± 2% (Left and right totals). (Refer to Fig. 7-26.)

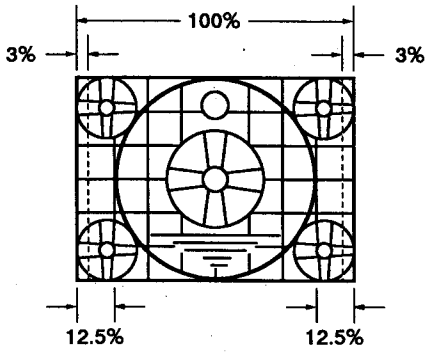
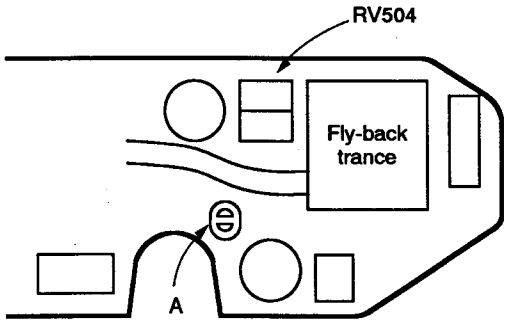


Fig. 7-25.



VF-42 board (section side)

Section A	Size H
Open	Small
Short	Big

Fig. 7-26.

7-3-7. Vertical Amplitude Adjustment (VF-42 board)

Model	Playback
Signal	Alignment tape: For checking operations (WR5-5NSP) Monoscope section
Adjusting Element	RV502
Specified Value	5 ± 2%

Adjusting method:

1) Adjust RV502 so that the vertical direction over scan becomes 5 ± 2% (Top and bottom totals).

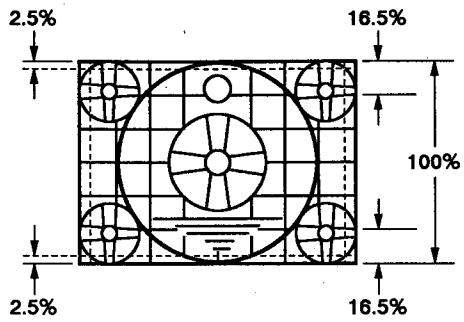


Fig. 7-27.

7-3-8. Brightness, Contrast Adjustments (VF-42 board)

Model	Playback
Signal	Alignment tape: For checking operations (WR5-5NSP) Monoscope section
Adjusting Element	Brightness: RV504 Contrast: RV503

Adjusting method:

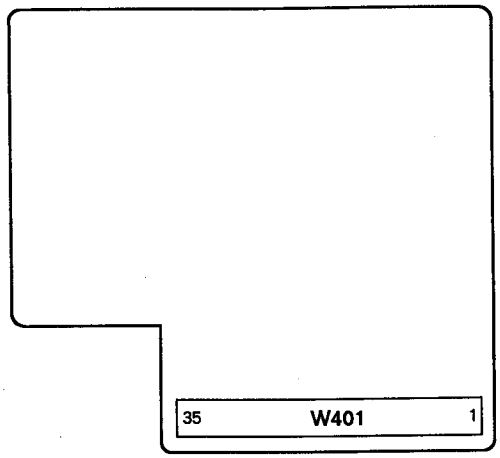
1) Rotate RV504 and RV503 alternately, and adjust so that the bright/dark sections of the gray scale are displayed correctly. (The bright section should be unsatisfactory till the cross hatch appears vague in the monoscope circle. The dark section should be unsatisfactory till the darkest section and the second darkest section of the gray scale cannot be differentiated.)

7-3-9. Horizontal Amplitude, Vertical Amplitude, Focus Check

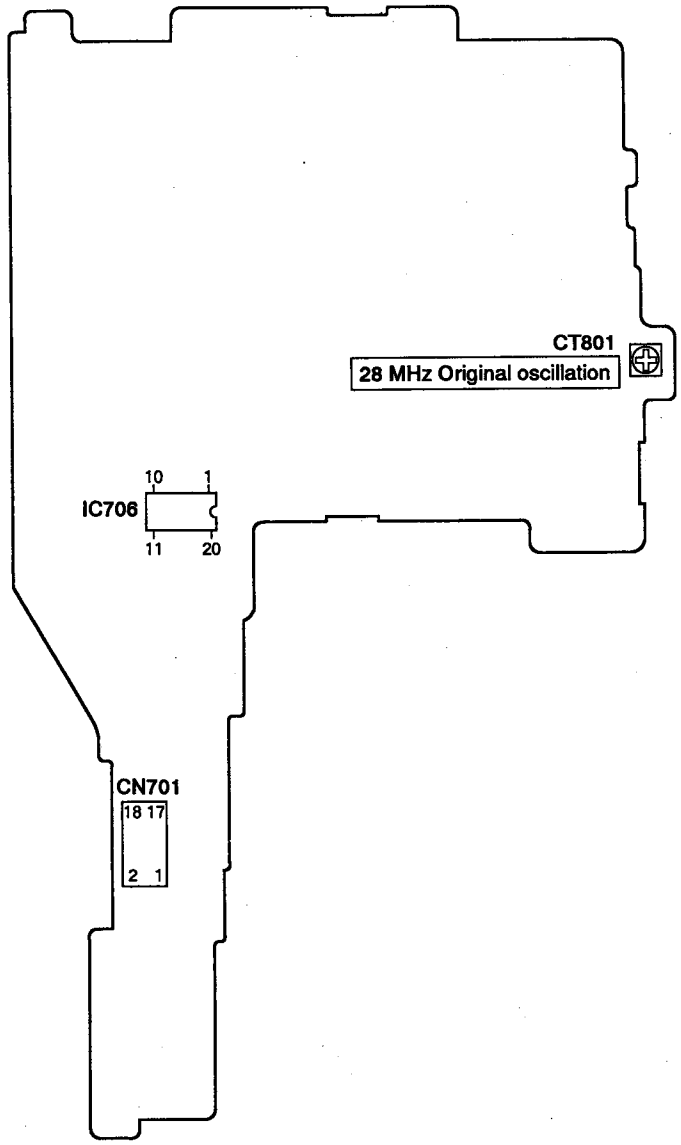
"7-3-6. Horizontal Amplitude Adjustment" and "7-3-7. Vertical Amplitude Adjustment" should both satisfy the specified values. If not, perform the adjustments from the beginning again. In this case, perform [7-3-8. Brightness, Contrast Adjustments] again. Moreover, check the focus, and if it found to be vague, perform "7-3-3. Focus Adjustment" and "7-3-4. Aberration Adjustment".

7-4. ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS

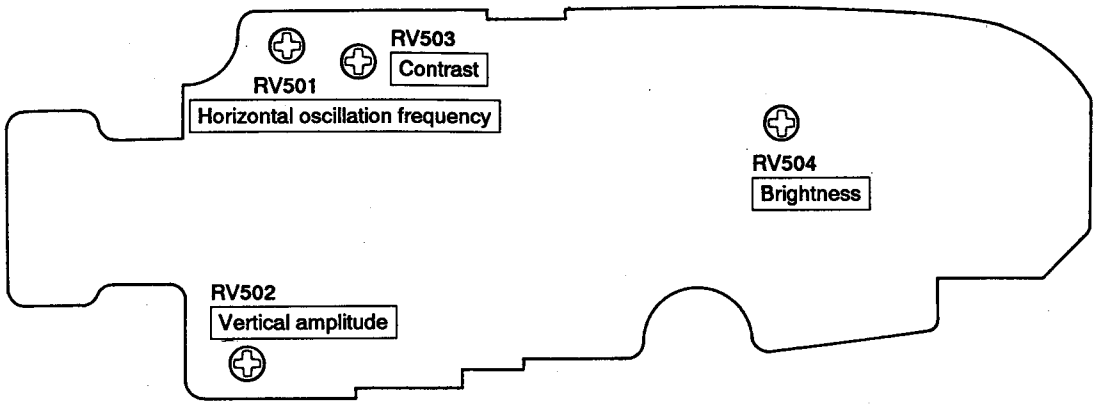
DD-47 BOARD (COMPONENT SIDE)



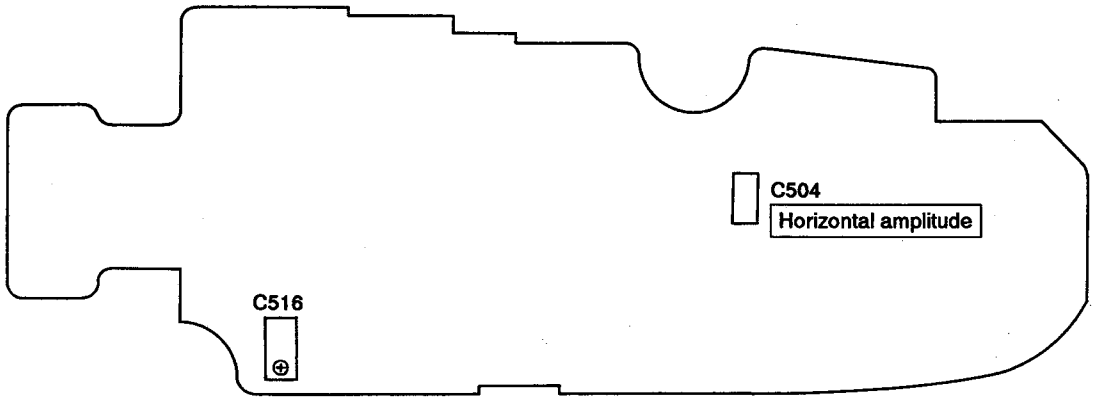
VC-112 BOARD (CONDUCTOR SIDE)



VF-42 BOARD (COMPONENT SIDE)



VF-42 BOARD (CONDUCTOR SIDE)



SECTION 8
MECHANICAL SECTION ADJUSTMENTS

Mechanical Section Adjustments

For details on the adjustments and checks of mechanical section and the mechanical parts, refer to the separate volume-"8 MM Video Mechanical Section Adjustment Guide II [FL mechanism (Q mechanism)]".

8-1. OPERATING WITH THE CASSETTE COMPARTMENT HOLDER ASSEMBLY REMOVED (Refer to Fig. 8-1.)

1. Loading

1) Refer to "2. Removal", and supply the power with the external section removed (however, leave the LJ-9 board connected so that the adjusting remote control unit can be connected.). (So that the mechanical deck section can be operated.)
2) Connect the adjusting remote control unit, and turn ON the HOLD switch.
3) Select page: 1, address: 00, and set data: 01.
(Release of the protect)
4) Select page: D, address: 01, and set data: 01.
(Test mode 1 setting)
5) Press the PAUSE button of adjusting remote control unit.
6) Turn off the HOLD switch of the adjusting remote control unit. (The adjusting remote control unit can be disconnected after this.)
7) The unit will be set into the loading mode when the lock board release arm ① is pressed in the direction of the arrow.
(To set the unit into the record mode, hold the push switch ② in place with the cohesion tape ③ before performing this operation.)
8) After completing all operations, be sure to perform "5. Processing after completing operations".

2. Setting the unit into the playback condition

1) Perform steps 1) to 7) of "1. Loading".
2) Press the playback button.

3. Setting the unit into the recording condition

1) Perform steps 1) to 7) of "1. Loading".
2) Press the record switch.
Note: Refer to "VIDEO SECTION ADJUSTMENT" to set the models without the record switch into the record condition.

4. Ejecting

1) Press the EJECT button.

5. Processing after completing operations

1) Connect the adjusting remote control unit, and turn on the HOLD switch.
2) Select page: 1, address: 00, and set data: 01.
3) Select page: D, address: 01, and set data: 00.
4) Press the PAUSE button of the adjusting remote control unit.
5) Remove the power supply from the unit.

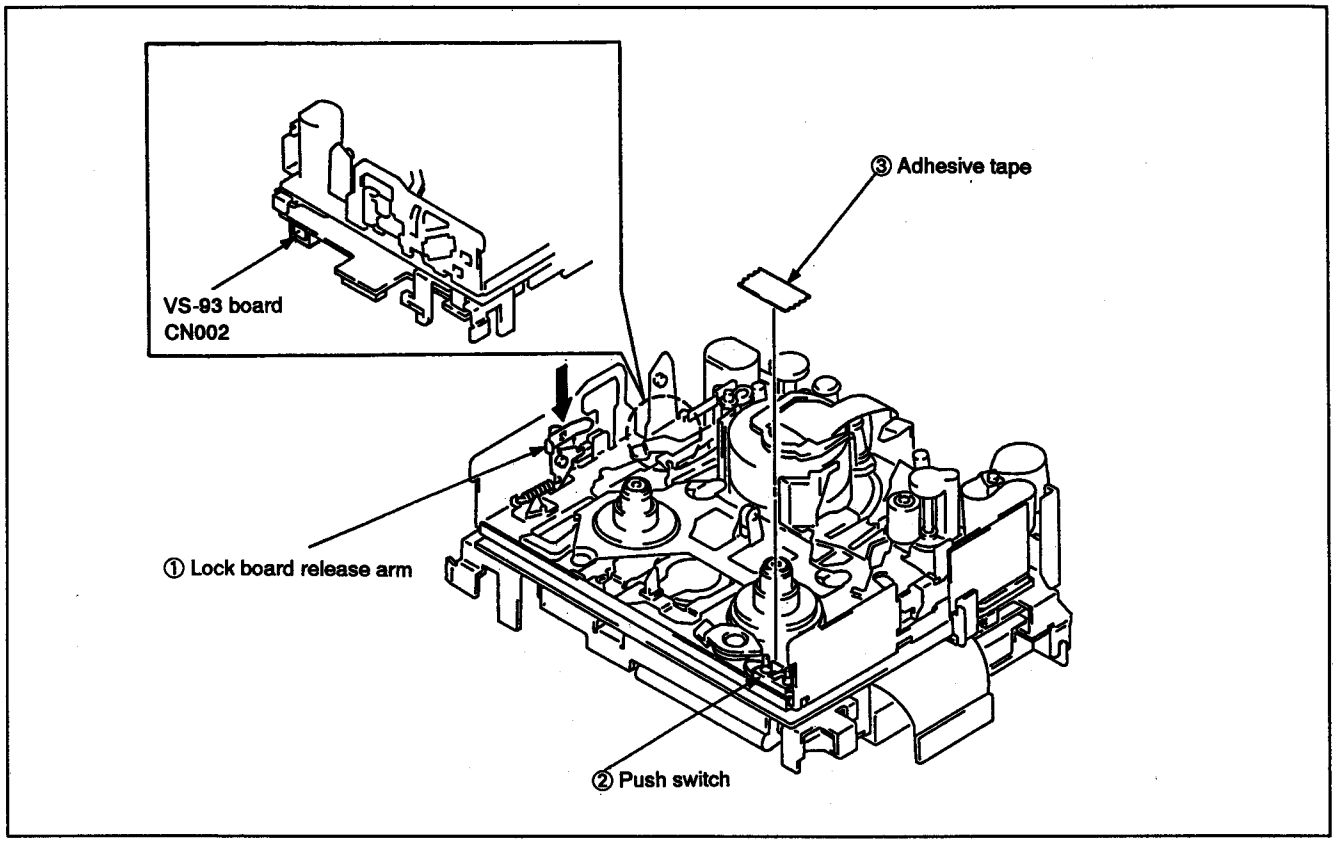

VS-93 board
CN002
③ Adhesive tape
① Lock board release arm
② Push switch

Fig. 8-1.

8-2. TAPE PATH ADJUSTMENT

1. Preparations for adjustment

1) Clean the tape path face (tape guide, drum, capstan shaft, pinch roller).
2) Connect the adjusting remote control unit to the remote terminal (LJ-9 board J971).
3) Turn on the HOLD switch of the adjusting remote control unit.
4) Select page: 1, address: 00, and set data: 01.
   (Release of the protect)
5) Select page: D, address: 01, and set data: 03.
   (Set the track shift mode. The adjusting remote control unit can be disconnected if its PAUSE button is pressed. In this case, be sure to perform "8-1-5. Processing after completing operation" after completing adjustments.)
6) Connect the oscilloscope.
   Channel 1-VS-93 board Pin ⑭ of CN002
   External trigger-VS-93 board Pin ⑨ of CN002
   (Connect the oscilloscope via the measuring pin for the video section (J-6082-140-A).)
7) Playback the alignment tape (WR5-1NP) for tracking.
8) Confirm that the EDIT switch is OFF position.
9) Check that the RF waveform of the oscilloscope is flat at both the entrance and the exit sides.
   If not, perform the following adjustment.
10) Perform "8-1-5. Processing after completing operations", after completing adjustments.

VS-90 board CN002

1	N.C
2	N.C
3	RF GND
4	CAP FG
5	REC 1B
6	REC 2B
7	REC 1A
8	REC 2A
9	RF SWP
10	1/2 RF SWP
11	PB RF CH1
12	PB RF CH2
13	RF GND
14	PB RF OUT

SECTION 9
VIDEO SECTION ADJUSTMENT

When performing adjustments, refer to the layout diagrams for adjustment related parts beginning from page 258.

9-1. PREPARATIONS BEFORE ADJUSTMENT

The following adjusting instruments are used for adjusting the video section.

9-1-1. Equipments to be used

1) TV monitor
2) Oscilloscope: 2 phenomena, band 30 MHz or wider, with delay mode. (Use a 10:1 probe unless specified otherwise.)
3) Frequency counter
4) Pattern generator with video output terminal
5) Digital voltmeter
6) Audio generator
7) Audio level meter
8) Audio distortion meter
9) Audio attenuater
10) Regulated power supply
11) Alignment tape
    For tracking adjustment (WR5-1NP)
    Part Code: 8-967-995-02
    For video frequency characteristics adjustment (WR5-6N)
    Part Code: 8-967-995-12
    For checking operations (WR5-4NL)[Note 1]
    Part Code: 8-967-995-51
    (WR5-5NSP)[Note 2]
    Part Code: 8-967-995-42
    For checking AFM stereo operations (WR5-9NS)
    Part Code: 8-967-995-23
    Note: The following alignment tapes can also be used.
    1) WR5-3NL (8-967-995-31)
    2) WR5-4NSP (8-967-995-41)
12) Remote control unit for adjustment (J-6082-053-A)
13) JK-3100 board extension cord (10P, 1 mm)
    Part Code: J-6082-064-A
14) AU-135 board, Cabinet (R) extension cord (30P, 0.8 mm)
    Part Code: J-6082-135-A
15) Measuring pin for video section
    Part Code: J-6082-140-A

9-1-2. Connecting the equipments

Unless specified otherwise, connect the measuring instruments as shown in Fig. 9-1 and perform the adjustments.

- Camera/video power switch ·····Position of the video
- Input/output switchover switch
  ····· Input position (Record mode)
  Output position (Playback mode)
- Connect the adjusting remote control unit to the remote terminal (LJ-9 board J971).

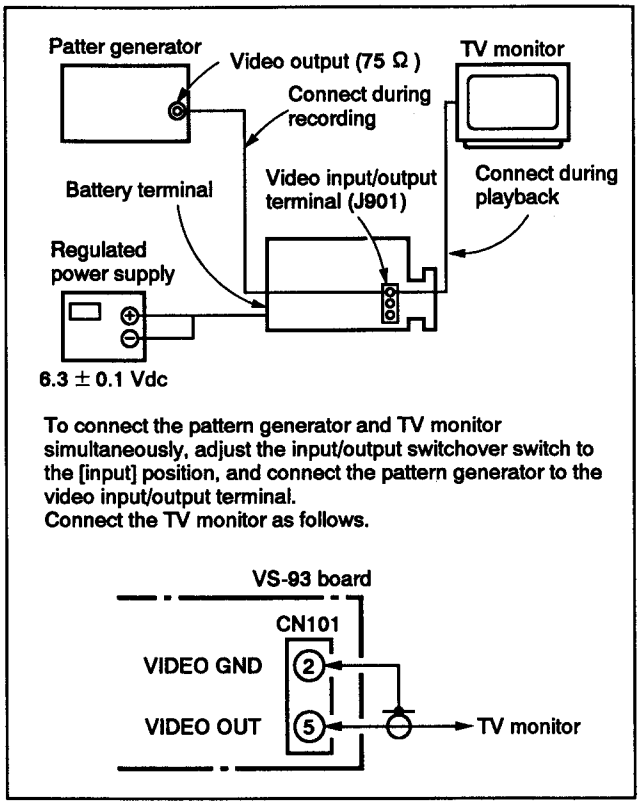

Patter generator
Video output (75 Ω)
TV monitor
Connect during recording
Battery terminal
Video input/output terminal (J901)
Connect during playback
Regulated power supply
6.3 ± 0.1 Vdc
To connect the pattern generator and TV monitor simultaneously, adjust the input/output switchover switch to the [input] position, and connect the pattern generator to the video input/output terminal.
Connect the TV monitor as follows.
VS-93 board
CN101
VIDEO GND
2
VIDEO OUT
5
TV monitor

Fig. 9-1.

9-1-3. Precautions upon adjustment

The EVF (Electronic viewfinder) is not required for adjusting the video section.

Remove the following connector when removing the EVF section.

1. VS-93 board CN102 (6 PIN)

The front panel section assembly is required for adjusting the video section. Remove the following connectors when removing the front panel section assembly.

1. MA-143 board CN553 (5 PIN)
2. MF-175 board CN996 (7 PIN)

The cabinet (R) is required for adjusting the video section. Use the extension cord (J-6082-134-A) when adjusting the video section.

Connect the cabinet (L) (JK-3100 board) with an extension cord (J-6082-064-A).

9-1-4. Connectors for adjustments (VS-93 board CN002)

Some video section adjustment points are concentrated on the VS-93 board CN002. Connect the measuring instrument via a measuring pin jig (J-6082-140-A).

Pin No.	Signal Name	Pin No.	Signal Name
1	N.C	2	N.C
3	RF GND	4	CAP FG
5	REC 1B	6	REC 2B
7	REC 1A	8	REC 2A
9	RF SWP	10	$\overline{1/2\ RF\ SWP}$
11	PB RF CH1	12	PB RF CH2
13	RF GND	14	PB RF OUT

Table 9-1.

9-1-5. Set-up during Adjustment

As the video signal obtained from the pattern generator is used as an adjustment signal during electric adjustments, ensure that this video output signal is within the specification. Connect the oscilloscope to pin ① of CN101 on the VS-93 board, and check that the amplitude of the sync signal of the video signal is approximately 0.3V, the amplitude of the video section is approximately 0.7V, the amplitude of the burst signal is approximately 0.3V and flat, and that the level ratio of the burst signal and the [red] signal is 0.30: 0.66. The video signal (color bar) used for electric adjustments is shown in Fig. 9-2.

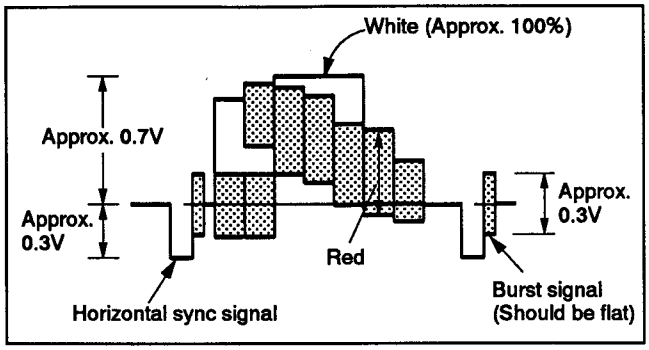


Fig. 9-2. Color Bar Signal of the Pattern Generator

9-1-6. Alignment Tape

The following table lists alignment tapes which are available. Use the tape specified in the signal column for each adjustment.

If the type of tape to be used for checking operations is not specified, use whichever type.

Name	Record-ing mode	Tape type	Tape speed	Recording contents		Usage
				Video area	PCM area	
Tracking WR5-1NP	L	MP	SP	CH2: Signal for 1 MHz tape path adjustment		Tape path adjustment Switching position adjustment
Video frequency characteristics WR5-6N	L	MP	SP	RF sweep 0 to 10 MHz Marker 1, 3.58, 5.5, 7 MHz		Frequency characteristics adjustment
Operation check (SP mode) WR5-5NSP	L	MP	SP	• Video signal Color bar 4 minutes Monoscope 4 minutes • Audio signal (AFM) 400 Hz 60% modulation	• Audio signal (PCM) Monoscope section 20 Hz 20 sec. } Color bar section 400 Hz 20 sec. } Color bar section 14 kHz 20 sec. } Color bar section Repeated 4 times 1 kHz 4 minutes	Checking operations
Operation check (LP mode) WR5-4NL	L	MP	LP	• Video signal Color bar 4 minutes Monoscope 4 minutes • Audio signal (AFM) 400 Hz 60% modulation		
AFM stereo Operation check WR5-9NS	L	MP	SP	• Video signal Color bar 4 minutes Monoscope 4 minutes • Audio signal (AFM) Stereo section (color bar) Lch: 400 Hz, Rch: 1 kHz (L+R: 1.5 MHz ± 60 kHz DEV L–R: 1.7 MHz ± 30 kHz DEV) Bilingual section (Monoscope) MAIN: 400 Hz (1.5 MHz ± 60 kHz DEV) SUB: 1 kHz (1.7 MHz ± 30 kHz DEV)	• Audio signal (PCM) 400 Hz	AFM stereo Checking operations

Note: Recording mode
L ····· Conventional mode
E ····· hi8 (hi band) mode

Tape type
MP ····· Particle type metal tape
ME ····· Evaporated type metal tape

Table 9-2.

Fig. 9-3. shows the 75% color bar signals recorded on the alignment tape.

Note: Measure using the video input/output terminal (Terminated at 75 Ω)

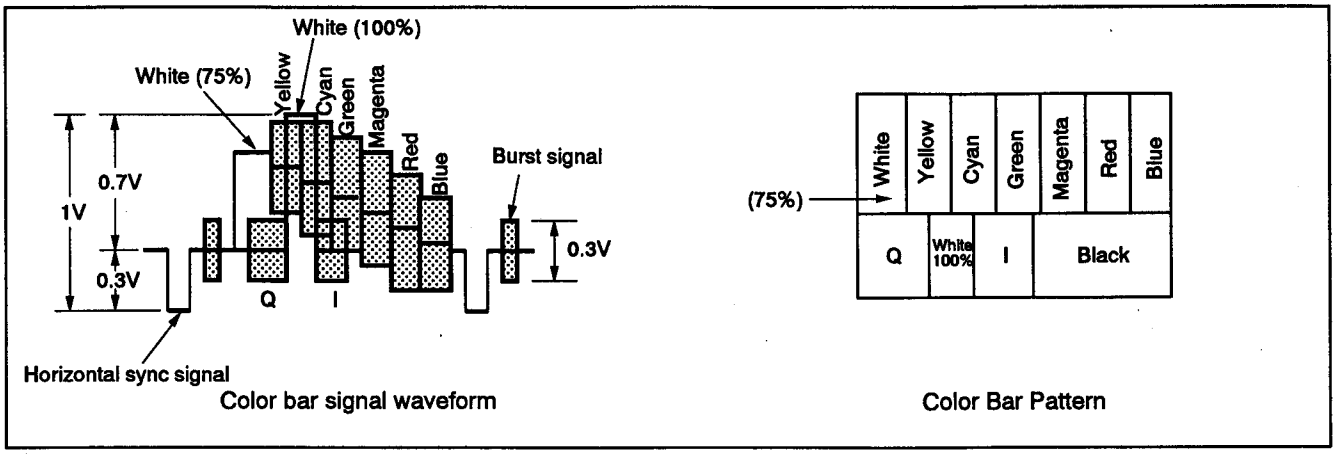


Fig. 9-3. Color Bar Signals of the Alignment Tape

9-1-7. Input/Output Level and Impedance

Video input	Pin jack Input signal: 1 Vp-p, 75 Ω unbalanced, sync negative
Video output	Pin jack Output signal: 1 Vp-p, 75 unbalanced, sync negative
Audio input	Pin jack Input level: –7.5 dBs (odBs=0.775 Vrms) Input impedance: Above 47 kΩ
Audio output	Pin jack Specified output: –7.5 dBs Output impedance: Below 2.2 kΩ

9-1-8. Service Mode

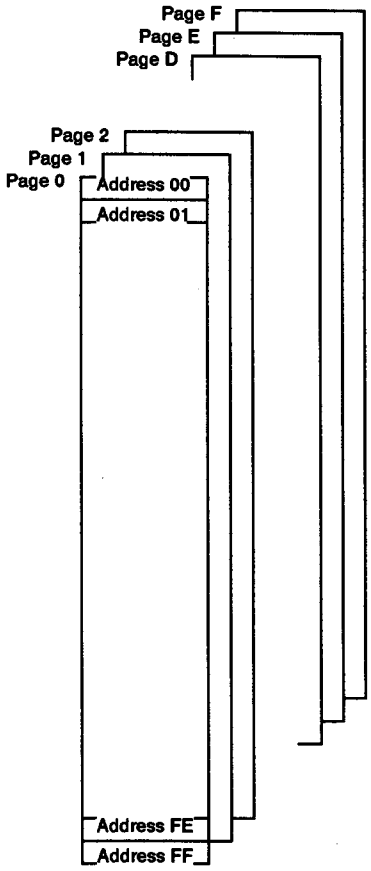
1. Setting the Service mode

The service mode consists of the adjustment mode which adjusts the EVR and the test mode which displays the condition of the unit.

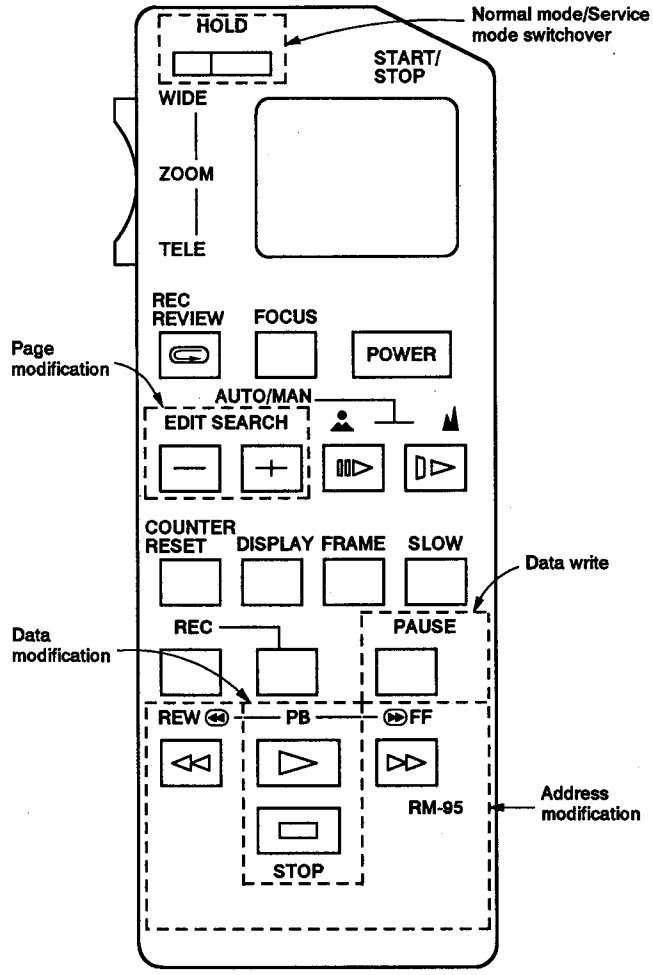
The unit can be shifted into the test mode and adjustment mode by connecting the adjusting remote control unit (set the HOLD switch to the HOLD side).

Adjusting Remote Control Unit LCD Display

(1) Service LANC memory map

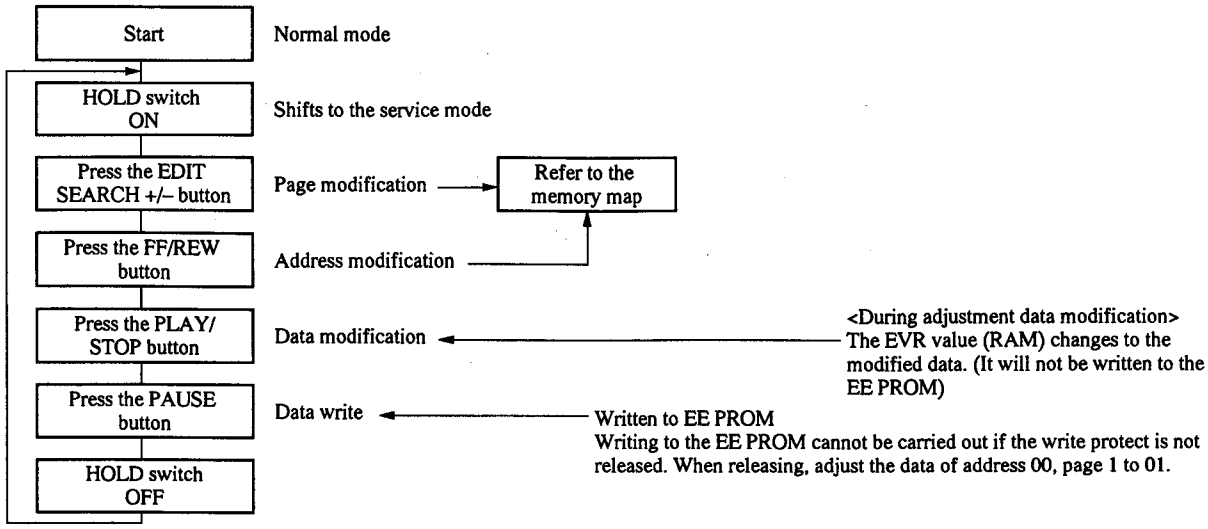


Adjusting remote control unit RM-95 (J-6082-053-A)



Page	Page allocation	Description
0	Not used	
1	Mode Control RAM, I/O	RAM and I/O interface data memory area required for operating the mode controller. Data is not held when the power is turned off because this area is not ROM.
2~4	Mechanical Control RAM, I/O	RAM and I/O memory area of the mechanical controller.
5	Not used	
6~8	Camera Control RAM, I/O	RAM and I/O memory area of the camera control.
9	Not used	
A	Camera Control RAM, I/O	RAM and I/O memory area of the camera control.
B, C	Not used	
D	VTR EE-PROM	ROM memory area of the VTR part. Data of this area is held by EE-PROM when the power is turned off. Releasing protect is required for changing data.
E	Not used	
F	Camera EE-PROM	ROM memory area of the camera part. Data of this area is held by EE•P•ROM when the power is turned off.

(2) Shifting to the Service Mode Using the Adjusting Remote Control Unit


Start
Normal mode
HOLD switch ON
Shifts to the service mode
Press the EDIT SEARCH +/– button
Page modification
Refer to the memory map
Press the FF/REW button
Address modification
Press the PLAY/ STOP button
Data modification
<During adjustment data modification>
The EVR value (RAM) changes to the modified data. (It will not be written to the EE PROM)
Press the PAUSE button
Data write
Written to EE PROM
Writing to the EE PROM cannot be carried out if the write protect is not released. When releasing, adjust the data of address 00, page 1 to 01.
HOLD switch OFF

Command Name	Command Function	Normal LANC command
Page Up	Page +1	Edit Search +
Page Down	Page –1	Edit Search –
Direc Page Set	Sets the specified page	Event Clear
Address Up	Address +1	Fast Forward
Address Down	Address –1	Rewind
Data Up	Data +1	Play Back
Data Down	Data –1	Stop
Store	Write the data to the EE PROM. RAM	Pause

2. Types of Self-diagnostic Feature

MODE		Contents
TEST	Camera adjustment	Refer to Camera Adjustment
	Switching position adjustment	Refer to each adjustment page
	Battery DOWN adjustment	
	Video, Audio adjustment	
ADJUST	Pass Adjustment track shift	When adjusting tape pass, set this mode and shift the tracking.
	Emergency STOP inhibition	Detection of emergency is inhibited. This allows the following items. • Power is not turned off when the battery is ended. • SP/LP is not automatically distinguished. • Emergence is not detected except for TOP/END detection of the TAPE.
	Read of emergence code	The following functions are added to the emergency display function currently in use. ① The lithium battery is not required because to memorize into EE-PROM is allowed. ② The first emergency and the last emergency are memorized. ③ The mode when the emergency is generated is memorized, in addition to the emergency contents.
	Motor single check	Rotating in forward direction, reverse direction, stopping of each motor can be separately controlled. • Drum motor • Capstan motor • Loading motor
	Function switch check	The acceptance of the function switch of the unit can be confirmed by designating an address. On the contrary, RM-95 can command the substitution for the function switch of the unit.
	Mechanical switch check	The contents of the mechanical switch and the mode switch can be confirmed.
	Sensor check	The following sensor is input by performing A/D converting, and the A/D converted value can be confirmed. TOP sensor, End sensor, S REEL FG, T REEL FG, Thermistor for SWP correction, DEW sensor.
	Reception contents check of wireless remote control	The received code contents of the remote control code can be confirmed.

3. Page D Write Protect

Release/set the page D write protect.

Page 1	Address 00

Data	Function
00	Normal (Write protect condition)
01	Write protect release

4. Page F Write Protect

Release/set the page F write protect.

Page 6	Address 00

Data	Function
10	Normal (Write protect condition)
01	Write protect release

5. Test Mode Setting

Each type of test mode is set/released. Release the protect (page: 1, address: 00, data: 01), before setting the data.

Page D	Address 01

Data	Function
00	Normal
01	Test mode 1 Various emergency inhibition and release Drum, capstan, loading motor, reel, tape top, end, DEW SP/LP automatic distinction inhibition, manual switchover (EDIT SW ON: LP, OFF: SP) 5 minutes pause release inhibition Power off inhibition • release by battery end
02	Test mode 2 1'CH frequency response adjustment (Not used) SP/LP automatic distinction inhibition, manual switchover (EDIT SW ON: LP, OFF: SP)
03	Test mode 3 Track shift Plays back the track shift Rear lock distinction inhibition during PB SP/LP automatic distinction inhibition, manual switchover (EDIT SW ON: LP, OFF: SP)
04	Test mode 4 Rear lock mode Rear lock playback is performed SP/LP automatic distinction inhibition, manual switchover (EDIT SW ON: LP, OFF: SP)
05	Test mode 5 SP/LP automatic distinction inhibition, manual switchover (EDIT SW ON: LP, OFF: SP)

※ This address data will be recorded on the non-volatile memory by pressing the PAUSE button on the adjusting remote control unit. Take note, as when this happens, the test mode will not be released even if the main power is turned off (6.3 Vdc).

※ Be sure to return the data of this address data to 00 after completing adjustments/repairs.

6. Emergency code

Troubles (errors) can be checked.

Page D	Address 06

First emergency code

·····The first error code generated

Page D	Address 07

Last emergency code

····· The last error code generated (this data will be modified each time an error occurs.)

※ Be sure to rewrite the data of addresses 06 and 07 to 00 after completing repairs/adjustments.

※ When rewriting data, be sure to press the PAUSE button of the remote control unit after resetting the data.

Code	Error condition
00	No error
01	Loading motor error
02	Reel error during unloading
03	Other reel errors
04	Capstan error
05	DRUM FG error during drum start up
06	DRUM PG error during drum start up
07	DRUM FG error during drum regular condition
08	DRUM PG error during drum regular condition
09	DRUM Phase error during drum regular

7. Emergency mode

The operation mode during an error outbreak can be checked.

Page D	Address 08

First emergency mode

·····The operation mode when the first error is generated

Page D	Address 09

Last emergency mode

·····The operation mode when the last error is generated
(This data will be modified each time an error occurs.)

※ Be sure to rewrite the data of addresses 08 and 09 to 00 after completing repairs/adjustments.

※ When rewriting data, be sure to press the PAUSE button of the remote control unit after setting the data.

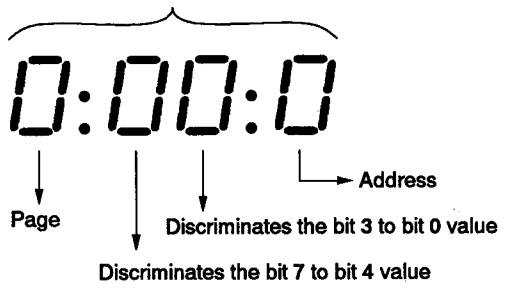
※ Addresses 08 and 09 of page 0 and addresses 08 and 09 of page D have the same functions.

Code	Error condition
00	BEFOR INITIALIZE
01	EJECTED
02	NORMAL STOP
03	FF
04	NORMAL REC
06	NORMAL PB
07	PB PAUSE
12	LOADING
14	REC PAUSE
27	1/5 SLOW
31	UNLOADING
46	CUE
56	REVIEW
62	STOP TAPE END
67	FRAME
72	STOP TAPE TOP
83	REWIND
85	REC REVIEW(+)
95	REC REVIEW(–)
A2	EMERGENCY STOP
A5	EDIT SEARCH(+)
B1	EMERGENCY UNLOADING
B2	STOP EMERGENCY 1
B5	EDIT SEARCH(–)
C2	STOP EMERGENCY 2
E2	STOP NO CASSETTE
F5	EDIT PAUSE

8. Bit value Discrimination

It is necessary to discriminate the bit value by the adjusting remote control unit display data for the following items. Discriminate if the bit value is "1" or "0" using the following table.

Adjusting remote control unit display



	Remote Control Unit Display	Bit Value			
		bit 3 or bit 7	bit 2 or bit 6	bit 1 or bit 5	bit 0 or bit 4
	0	0	0	0	0
	1	0	0	0	1
	2	0	0	1	0
	3	0	0	1	1
	4	0	1	0	0
	5	0	1	0	1
	6	0	1	1	0
	7	0	1	1	1
Ⓐ→	8	1	0	0	0
	9	1	0	0	1
	A(R)	1	0	1	0
	B(b)	1	0	1	1
	C(c)	1	1	0	0
	D(d)	1	1	0	1
Ⓑ→	E(E)	1	1	1	0
	F(F)	1	1	1	1

(Example) When the remote control unit display data is "8E", the bit values of bit 7 to bit 4 can be discriminated from column Ⓐ, and that of bit 3 to bit 0 can be discriminated from column Ⓑ.

9. Check of Tape Distinction Switch, etc.

Page 1	Address 3E

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
				$\overline{\text{REC PROOF}}$	ME/$\overline{\text{MP}}$	Hi8/$\overline{\text{Normal}}$	

"1"=Recording impossible
"0"=Recording possible

"1"=ME tape
"0"=MP tape

"1"=Hi8 mode playback
"0"=Normal mode playback

Page 1	Address 23

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
					$\overline{\text{CC LOCK}}$		

"0"=During cassette compartment lock

Page 1	Address 3D

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
V MUTE	A MUTE	VA PB MODE	JOG	PB CLOG	REC CLOG	SYNC DET	LP/$\overline{\text{SP}}$

"1"=LP mode playback
"0"=SP mode playback

"1"=SYNC is detected
"0"=SYNC is not detected

"1"=CLOG is detected
"0"=Normal

"1"=When the PB RF signals are being playback normaly
"0"=Others

"1"=JOG mode
"0"=Other

"1"=Playback mode
"0"=Others

"1"=AUDIO MUTE: ON
"0"=AUDIO MUTE: OFF

"1"=VIDEO MUTE: ON
"0"=VIDEO MUTE: OFF

Page 1	Address 42

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
	PB 1.7M DET	$\overline{\text{JACK MONO}}$	$\overline{\text{MIC MONO}}$			DEW	

"0"=Dew outbreak
"1"=Others

"0"=During monaural external microphone use
"1"=Others

"1"=Audio input/output terminal (right) open condition
"0"=Audio input/output terminal (right) connection condition

"1"=During AFM stereo/bilingual tape playback
"0"=Others

10. Mode Switch Check

The mode switch position (mechanical section condition) can be checked.

Page 1	Address 3E

Mode switch position	Adjusting remote control display data	Bit 7 (MODE SW C)	Bit 6 (MODE SW B)	Bit 5 (MODE SW A)
EJECT	8 *	1	0	0
USE	6 *	0	1	1
LS	C *	1	1	0
GL	4 *	0	1	0
RP (REC, PB, FF, REW, CUE, REVIEW, PAUSE)	A *	1	0	1
READY (STOP)	2 *	0	0	1

* : 0 to F

11. Mechanism Control Micro Processor Input/Output Signal Level Check

Page 2	Address E2

Bit	Signal	Pin No.	I/O	Level
5	JACK MONO	7	I	"1"=H "0"=L
6	PB 1.7M DET	6	I	
7	$\overline{\text{MIC MONO}}$	5	I	

Page 2	Address E3

Bit	Signal	Pin No.	I/O	Level
0	$\overline{\text{EDIT}}$	28	O	"1"=H "0"=L
1	SP/$\overline{\text{LP}}$	27	O	
2	CAM/$\overline{\text{LINE}}$	26	O	
3	Hi8/$\overline{\text{NORMAL}}$	25	O	
4	MX ON/$\overline{\text{OFF}}$	24	O	
5	MX SEL 2	23	O	
6	MX SEL 1	22	O	
7	LINE MIX	21	O	

Page 2	Address E4

Bit	Signal	Pin No.	I/O	Level
0	$\overline{\text{S JACK IN}}$	76	I	"1"=H "0"=L
1	CFG HMS	75	I	
4	VA PB MODE	72	O	
5	TAPE LED ON	71	O	
6	ME/$\overline{\text{MP}}$	70	O	
7	DS ON	69	O	

Page 2	Address E5

Bit	Signal	Pin No.	I/O	Level
0	$\overline{\text{DEW DET}}$	56	I	"1"=H "0"=L
1	TAPE TOP	55	I	
2	TAPE END	54	I	
4	FULL MUTE	49	O	
6	AUDIO MUTE	47	O	
7	MONO REC	46	O	

Page 2	Address E7

Bit	Signal	Pin No.	I/O	Level
0	$\overline{\text{REEL HALL CONT}}$	36	O	"1"=H "0"=L
3	DRUM FWD/$\overline{\text{RVS}}$	33	O	
4	DRUM ON	32	O	
5	LM LIM CONT	31	O	
6	LOAD	30	O	
7	UNLOAD	29	O	

Page 2	Address E8

Bit	Signal	Pin No.	I/O	Level
2	CLOG DET	82	I	"1"=H "0"=L
5	$\overline{\text{LM LIM ON}}$	79	I	

Page 2	Address E9

Bit	Signal	Pin No.	I/O	Level
0	VIDEO MUTE	20	O	"1"=H "0"=L
1	E/$\overline{\text{L}}$ DET	19	I	
2	ME/$\overline{\text{MP}}$ SW	18	I	
3	REC PROOF SW	17	I	
5	MODE SW A	15	I	
6	MODE SW B	14	I	
7	MODE SW C	13	I	

Note: Refer to "Mode switch check".

12. Mechanism Control A/D Port Input Voltage Check

Page 4	Address 14

Checking method:

1) Set data: 02 to page: 4, address: 0E.
   (A/D conversion processing active)
2) Set the data in the following table to page: 4, address: 13, and select the A/D port to be displayed.

Data	A/D Port
00	Pin ⑫: AN0 (T REEL FG)
01	Pin ⑪: AN1 (S REEL FG)
02	Pin ⑩: AN2 (ATF ERROR)
03	Pin ⑨: AN3 (BATT SENS)
04	Pin ⑧: AN4 ($\overline{\text{DEW}}$)

3) Check the data of page: 4, address: 14.

Adjusting Remote Control Unit Display Data	A/D Port Input Voltage
FF to 00	Approx. 5 Vdc to 0 Vdc

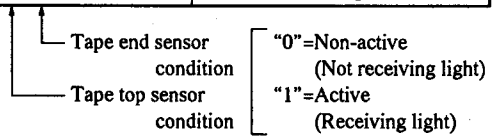
13. Tape Top/End Sensor Condition Check

Page 4	Address 0A

Checking method:

1) Set data: 10 to page: 4, address: 0E.
   (Tape top/end sensor condition sampling processing active)
2) Check the data of page: 4, address: 0A.

Adjusting Remote Control Unit Display Data	Tape Top/End Sensor Condition
0 0	Tape present (Middle of tape)
0 1	Tape top
1 0	Tape end
1 1	No tape



14. Battery Voltage Check

Page 4	Address 10

Adjusting Remote Control Unit Display Data	Battery Voltage
FF	Approx. 10 Vdc
F0	Approx. 9.4Vdc
E0	Approx. 8.8Vdc
D0	Approx. 8.2Vdc
C0	Approx. 7.5Vdc
B0	Approx. 6.9Vdc
A0	Approx. 6.3Vdc
90	Approx. 5.6Vdc
80	Approx. 5.0Vdc

15. Individual Operations of the Drum, Capstan, and Loading Motor

Page 4	Address 11

1) Adjust the mechanical section to the loading completion condition.
2) Release the protect.
   Page: 1, address: 00, data: 01
3) Set data: 01 to page: 4, address: 0E.
   (Control permission from the adjusting remote control unit of the motor)
4) By setting the data in the following table to page: 4, address: 11, the corresponding motors can be operated individually.
5) After checking the operations, turn off the main power (6.3 Vdc).

Data	Operation
00	Normal
02	Drum forward rotation
04	Drum reverse rotation
06	Capstan forward rotation
08	Capstan reverse rotation
0A	Loading motor forward rotation
0C	Loading motor reverse rotation
01	All motors stop
03	
05	
07	
09	
0B	
0D	
0F	

16. Mode control micro processor key matrix check

The key input can be checked.

Page 1	Address 68~6D

	Bit7	Bit6 (K IN 6)	Bit5 (K IN 5)	Bit4 (K IN 4)	Bit3 (K IN 3)	Bit2 (K IN 2)	Bit1 (K IN 1)	Bit0 (K IN 0)
Address 68 (K OUT 0)		LENS COVER OPEN	VTR POWER (CF-3200 S1)		PAUSE (CF-3200 S3)	REC (CF-3200 S6)	EJECT (CF-3200 S16)	HiFi SOUND 1 (CF-3200 S12)
Address 69 (K OUT 1)			CAMERA POWER (CF-3200 S1)	FF (CF-3200 S2)	PLAY (CF-3200 S4)	REW (CF-3200 S7)	STOP (CF-3200 S9)	HiFi SOUND 2 (CF-3200 S12)
Address 6A (K OUT 2)		PUSH FOCUS FIX (CF-3200 S30)	DIGITAL PICTURE (CF-3200 S31)	ZERO MEMORY (CF-3200 S21)	EDIT SEARCH (+) (CF-3200 S5)	EDIT SEARCH (-) (CF-3200 S8)	COUNTER RESET (CF-3200 S28)	EDIT ON/OFF (CF-3200 S13)
Address 6B (K OUT 3)		AUTO LOCK (CF-3200 S19)	PROGRAM AE (CF-3200 S20)		TIME (CF-3200 S23)	DATE (CF-3200 S26)		
Address 6C (K OUT 4)		EXPOSURE (+) (LC-40 S507)		AUTO FOCUS ON/OFF (CF-3200 S22)	SUPER IMPOSE COLOR/MODE (CF-3200 S24)	SUPER IMPOSE MEMORY (CF-3200 S27)	SUPER IMPOSE ON/OFF (CF-3200 S29)	OUT/IN (JK-3100 S921)
Address 6D (K OUT 5)		EXPOSURE (-) (LC-40 S507)	AREA (CF-3200 S10)	SUMMER TIME (CF-3200 S11)	EXPOSURE ON/OFF (CF-3200 S25)	FADER (MF-175 S997)	START/ STOP (CF-3200 S17)	REMOTE COMMANDER (CF-3200 S14)

"1"=key switch ON
"0"=key switch OFF

17. Wireless Remote Control Unit Reception Content Check

Page 1	Address 1E

Wireless remote control unit key pressed	Data
None	FF
TELE	9A
WIDE	9B
Start/stop	99
Rewind	1B
Fast forward	1C
Stop	18
Playback	1A
Data screen	5A
Pause	19
SLOW	23

18. EDIT Switch, Remote Commander Switch Check

Page 1	Address 0A

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
REC MODE (SP/LP)	REMOTE COMMANDER		EDIT				

"1"=OFF
"0"=ON

"1"=EDIT ON
"0"=EDIT OFF

"1"=LP
"0"=SP

19. HIFI Sound Switch, IN/OUT Switch Check

Page 1	Address 0B

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
		HiFi SOUND		IN/OUT			

"1"=IN
"0"=OUT

Switch Position		
1	0	1
2	1	0
GREEN MARK	0	0

20. White Balance Mode and Focus Mode Display/Switchover

Page 1	Address 9A

The mode can be switched when the data of page: 1, address: A3 is set to 04.

Data	White Balance Mode
* 1	INDOOR
* 2	OUTDOOR
* 3	HOLD
* 6	AUTO

Data	Focus Mode
0 *	Manual
1 *	Automatic

* : 0 to F

21. LCD, LED Check, etc.

Page 1	Address A3

Data	Mode
00	Normal
01	Key input prohibited
02	All segments of LCD, LED light up
04	Camera function renewal prohibited

22. Page D Address List

Note 1: The adjustment data initial value is the data to be input before performing video section adjustment (page D), when the page D data has been erased due to some cause.

Note 2: The data listed in the adjustment data memo column are the fixed data.
Check that these data have not been accidentally rewritten, after completing adjustments.

Address	Name	Function [ ] Indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
00	Category code	Not used	11	11
01	Test mode		00	00
02	Destination flag		43	43
03	BATT END	Battery end adjustment	8C	
04	SW POSITION	SW POSITION adjustment	00	
05	SW POSITION	SW POSITION adjustment	80	
06	EMERGENCY code (FIRST)	Error code and mode are memorized. Rewrite the data of these addresses to 00 after repairs/adjustments	00	00
07	EMERGENCY code (LAST)		00	00
08	EMERGENCY mode (FIRST)		00	00
09	EMERGENCY mode (LAST)		00	00
0A	SR DATA (MP NORMAL SP)	CXA1207 serial data	28	28
0B	SR DATA (MP NORMAL LP)	CXA1207 serial data	28	28
0C	SR DATA (ME Hi8 SP)	CXA1207 serial data	28	28
0D	SR DATA (ME Hi8 LP)	CXA1207 serial data	28	28
0E	SR DATA (ME NORMAL SP)	CXA1207 serial data	28	28
0F	SR DATA (ME NORMAL LP)	CXA1207 serial data	28	28
10	SR DATA (MP Hi8 SP)	CXA1207 serial data	28	28
11	SR DATA (MP Hi8 LP)	CXA1207 serial data	28	28
12	SR DATA (EDIT ON NORMAL)	CXA1207 serial data	28	28
13	SR DATA (EDIT ON Hi8)	CXA1207 serial data	28	28
14	CAM TITLE BLU R-Y	Camera titler color adjustment [Blue]. Not used	74	
15	CAM TITLE BLU B-Y	Camera titler color adjustment [Blue]. Not used	DA	
16	CAM TITLE GRN R-Y	Camera titler color adjustment [Green]. Not used	3E	
17	CAM TITLE GRN B-Y	Camera titler color adjustment [Green]. Not used	2C	
18	CAM TITLE CYN R-Y	Camera titler color adjustment [Light blue]. Not used	32	
19	CAM TITLE CYN B-Y	Camera titler color adjustment [Light blue]. Not used	86	
1A	CAM TITLE RED R-Y	Camera titler color adjustment [Red]. Not used	DE	
1B	CAM TITLE RED B-Y	Camera titler color adjustment [Red]. Not used	7A	
1C	CAM TITLE VIO R-Y	Camera titler color adjustment [Violet]. Not used	A0	
1D	CAM TITLE VIO B-Y	Camera titler color adjustment [Violet]. Not used	A6	
1E	CAM TITLE YEL R-Y	Camera titler color adjustment [Yellow]. Not used	8C	
1F	CAM TITLE YEL B-Y	Camera titler color adjustment [Yellow]. Not used	26	
20	Permission plug		20	20
21	Adjustment plug	FORCED VTR ON, CAM ON etc DATA: 01 = FORCED CAMERA POWER ON; 02 = FORCED VTR POWER ON	00	00
22~2C		Not used		

Table 9-2 (1).

Address	Name	Function [ ] Indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
2D	BATT REMAIN LEVEL 1	Amount of remaining battery 1	A0	
2E	BATT REMAIN LEVEL 2	Amount of remaining battery 2	99	
2F	BATT REMAIN LEVEL 3	Amount of remaining battery 3	94	
30	1A-ch REC C LEVEL (ME)	ME REC C level adjustment [IC156 ⑥]	B5	
31	1A-ch REC C LEVEL (MP)	MP REC C level adjustment [IC156 ⑥]	B5	
32	1B-ch REC C LEVEL (ME)	Not used	B5	B5
33	1B-ch REC C LEVEL (MP)	Not used	B5	B5
34	2A-ch REC C LEVEL (ME)	Not used	B5	B5
35	2A-ch REC C LEVEL (MP)	Not used	B5	B5
36	2B-ch REC C LEVEL (ME)	Not used	B5	B5
37	2B-ch REC C LEVEL (MP)	Not used	B5	B5
38	CAP FG BIAS	Capstan FG bias adjustment [IC158 ②]	80	
39~3D		Not used		
3E	2A-ch M.T Hi8		90	90
3F	2A-ch M.T NORMAL	2A ch playback frequency characteristic adjustment [IC158 ⑱]	90	
40	2B-ch M.T Hi8		90	90
41	2B-ch M.T NORMAL	2B ch playback frequency characteristic adjustment [IC158 ⑲]	90	
42	1A-ch M.T Hi8		90	90
43	1A-ch M.T NORMAL	1A ch playback frequency characteristic adjustment [IC158 ⑫]	90	
44	1B-ch M.T Hi8		90	90
45	1B-ch M.T NORMAL	1B ch playback frequency characteristic adjustment [IC158 ⑬]	90	
46	REC C RF (EE)	Not used		
47	REC C RF (PB)	Not used		
48	RF CONT (ME)	Not used		
49	RF CONT (MP)	Not used		
4A	EE LEVEL	EE level adjustment [IC156 ⑱]	67	
4B		Not used		
4C	COMB ADJ	Chroma comb filter adjustment [IC156 ⑬]	A3	
4D	SR-IR	IR adjustment [IC156 ④]	AB	
4E	Y-FM CARRIER (Hi8)	Y-FM carrier frequency [IC156 ③]	AB	AB
4F	Y-FM CARRIER (NORMAL)	Y-FM carrier frequency adjustment [IC156 ③]	AB	
50	Y-FM DEVIATION (Hi8)	Y-FM deviation [IC156 ②]	96	96
51	Y-FM DEVIATION (NORMAL)	Y-FM deviation adjustment [IC156 ②]	96	
52	REC Y LEVEL (EE Hi8 ME)		7A	
53	REC Y LEVEL (EE Hi8 MP)		7A	
54	REC Y LEVEL (EE NOR ME)	REC Y recording current adjustment (ME) [IC158 ⑨]	7A	
55	REC Y LEVEL (EE NOR MP)	REC Y recording current adjustment (MP) [IC158 ⑨]	7A	
56	REC Y LEVEL (PB)	Playback REC Y level [IC156 ⑤]	7A	7A
57	PB Y LEVEL (EE)	EE PB Y level [IC156 ⑤]	8B	8B
58	PB Y LEVEL (Hi8)	Hi8 PB Y level adjustment [IC156 ⑤]	8F	8F
59	PB Y LEVEL (NORMAL)	Normal PB Y level adjustment [IC156 ⑤]	8B	

Table 9-2 (2)

Address	Name	Function [ ] Indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
5A	EMPHASIS INPUT LEVEL	EE emphasis input level adjustment [IC156 ⑲]	9C	
5B	PB LINE LEVEL	Playback emphasis input level adjustment [IC156 ⑲]	AF	
5C~77		Not used		
78	L/R MX LEVEL (REC)	REC matrix adjustment [IC158 ③]	B0	
79	L/R MX LEVEL (PB)	PB matrix adjustment [IC158 ③]	A0	
7A	1.5 IR	1.5 MHz IR adjustment [IC158 ⑤]	90	
7B	1.5 DEV	1.5 MHz deviation adjustment [IC158 ④]	B0	
7C	1.7 IR	1.7 MHz IR adjustment [IC158 ⑦]	90	
7D	1.7 DEV	1.7 MHz Deviation adjustment [IC158 ⑥]	A0	
7E	AUDIO FADER	Not used		
7F~FF		Not used		

Table 9-2 (3)

9-2. POWER SYSTEM ADJUSTMENTS

1. Oscillator Frequency Check (DD-47 board)

Mode	Camera record
Subject	Arbitrary
Measurement Point	Q906 collector
Measuring Instrument	Frequency counter
Specified Value	510 ± 35 kHz

Adjusting method:

1) Check that the oscillator frequency satisfies the specified value.

2. Power Voltage Check (DD-47 board)

Mode	Camera record
Subject	Arbitrary
Measuring Instrument	Digital voltmeter
EVF 5V check	
Measurement Point	Pin ⑮ of W401
Specified Value	4.95 ± 0.1 Vdc
D5V check	
Measurement Point	Pins ⑦ and ⑧ of W401
Specified Value	4.91 ± 0.1 Vdc
D4V check	
Measurement Point	Pin ④ of W401
Specified Value	4.06+0.1 Vdc
VID 5V check	
Measurement Point	Pins ㉑ and ㉒ of W401
Specified Value	4.93 ± 0.1 Vdc
RP 5V check	
Measurement Point	Pin ㉔ of W401
Specified Value	4.94 ± 0.1 Vdc
AU5V check	
Measurement Point	Pin ㉓ of W401
Specified Value	4.93 ± 0.1 Vdc
CAM5V check	
Measurement Point	Pins ⑨ and ⑩ of W401
Specified Value	4.89 ± 0.15 Vdc
CAM15V check	
Measurement Point	Pin ⑫ of W401
Specified Value	15.09 ± 0.3 Vdc
CAM –9V check	
Measurement Point	Pin ⑪ of W401
Specified Value	–8.8 ± 0.7 Vdc
MOTOR 5V check	
Measurement Point	Pin ⑭ of W401
Specified Value	4.92 ± 0.1 Vdc

9-3. SYSTEM CONTROL SYSTEM ADJUSTMENTS

1. Page D Initial Value Input

If the page D data has been erased due to some cause, input the page D initial value before performing adjustments. For details on the initial value, refer to "Page D address list" in "9-1-9. Service Mode".

Mode	E-E
Signal	Arbitrary
Adjustment Page	D
Adjustment Address	00 to 7D

Input method:

1) Release the write protect.
   Page: 1, address: 00, data: 01
2) Select page D, and input the initial value to each address.
   (After setting the data (initial value), be sure to press the PAUSE button of the adjusting remote control unit before changing the address.)

2. Battery End Adjustment

Mode	E-E
Signal	Arbitrary
Measurement Point	LCD display of the adjusting remote control unit
Measuring Instrument	
Adjustment Page	D
Specified Value	03 (BATT END) 2D (BATT REMAIN LEVEL 1) 2E (BATT REMAIN LEVEL 2) 2F (BATT REMAIN LEVEL 3)

Connection:

1) Connect the regulated power supply and the digital voltmeter as shown in Fig. 9-5.

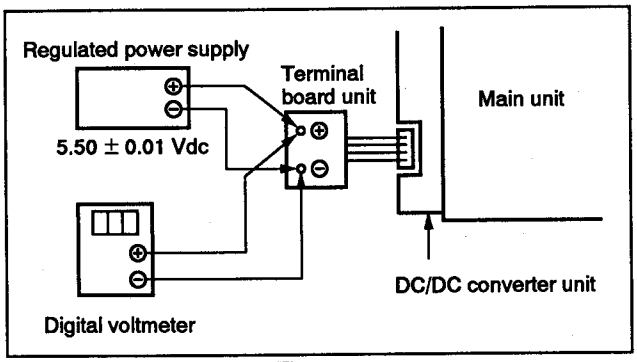


Fig. 9-4.

Adjusting method:

1) Adjust the output voltage of the regulated power supply so that the digital voltmeter display is 6.3 ± 0.1 Vdc.
2) Release the protect.
   Page: 1, address: 00, data: 01
3) Set data: 01 to page: D, address: 01.
   (Test mode 1 setting)
4) Adjust the output voltage of the regulated power supply so that the digital voltmeter display is 5.50 ± 0.01 Vdc.
5) Select page: 4, address: 10, read the adjusting remote control unit display data, and set to DEND.
6) Set data DEND to page: D, address: 03, and press the PAUSE button of the adjusting remote control unit.
7) Convert DEND to decimal to obtain DEND'. (Refer to Table 7-6. "Hexadecimal notation – decimal notation conversion table")
8) Obtain the adjustment data (decimal) by following formula (decimal notation calculation), convert to hexadecimal and enter the data into each adjustment address.
   Address: 2D $D_{2D}' = D_{END}' + 20$
   Address: 2E $D_{2E}' = D_{END}' + 13$
   Address: 2F $D_{2F}' = D_{END}' + 8$
   Note: After setting the data, be sure to press the PAUSE button of the adjusting remote control unit before changing the address.
9) Set data: 00 to page: D, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Test mode 1 release)
10) Perform "Battery Down Check".

3. Battery Down Check

Mode	Camera record
Subject	Arbitrary

Connection

1) Connect the regulated power supply and the digital voltmeter as shown in Fig. 9-5.

Checking method:

Remove the adjusting remote control unit, and perform the following check. If the check is not satisfied, perform from the beginning again.

1) Adjust the output voltage of the regulated power supply so that the digital voltmeter display becomes 6.3 ± 0.1 Vdc.
2) Set to the camera recording mode.
3) Decrease the output voltage of the regulated power supply so that the digital voltmeter display becomes 5.65 ± 0.01 Vdc.
4) Check that the mark on the EVF (viewfinder) display is not lighted up. (TALLY lamp lights up).
5) Decrease the the output voltage of the regulated power supply so that the digital voltmeter display becomes 5.53 ± 0.01 Vdc.
6) Check that the mark and the TALLY lamp on the EVF display on the EVF display blinks every second.
7) Decrease the the output voltage of the regulated power supply so that the digital voltmeter display becomes 5.47 ± 0.01 Vdc.
8) Check that the mark and the TALLY lamp on the EVF display are blinking faster, the VTR stops and the power supply turns off.

9-4. SERVO SYSTEM ADJUSTMENTS

1. Switching Position Adjustment (VS-93 board)

Mode	Playback
Signal	Alignment tape: For tracking adjustment (WR5-1NP)
Measurement Point	CH1: Pin ⑨ of CN002 (RF SWP) CH2: Pin ⑫ of CN002 (PB RF CH2)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	04 (SW POSITION) 05 (SW POSITION)
Specified Value	t1=0 ± 10 μsec

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Set data: 80 to page: D, address: 05.
3) Change the data of page: D, address: 05 and minimize "t1". (Coarse adjustment)
4) Press the PAUSE button of the remote control unit.
5) Change the data of page: D, address: 04, and adjust so that the switching position (t1) becomes the specified value. (Fine adjustment)
6) Press the PAUSE button of the adjusting remote control unit.

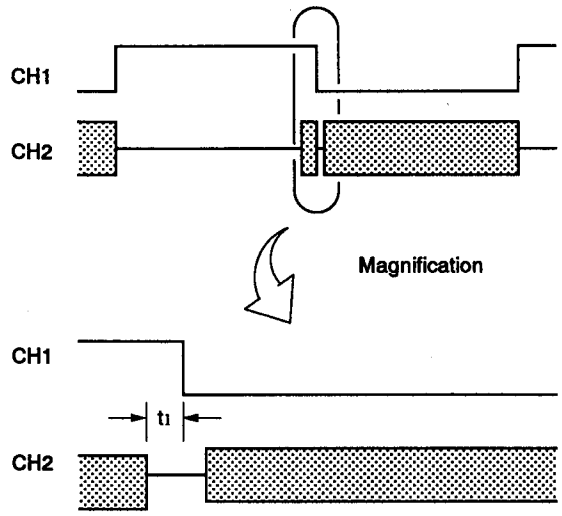


Fig. 9-5.

2. CAP FG Duty Adjustment (VS-93 board)

Mode	Record (SP)
Signal	Color bar
Measurement Point	Pin ④ of CN002 (CAP FG)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	38 (CAP FG BIAS)
Specified Value	Duty=50 ± 1%

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Set data: 80 to page: D, address: 38.
3) Change the data of page: D, address: 38, and adjust the duty of the CFG waveform to the specified value.
4) Press the PAUSE button of the adjusting remote control unit.

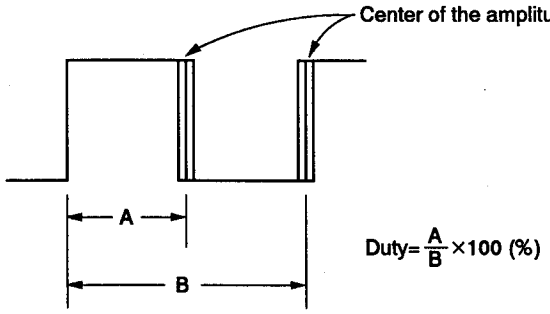


Fig. 9-6.

9-5. VIDEO ADJUSTMENTS

The adjustments of the video system must be performed according to the following adjustment procedure.
The color video signal supplied from the pattern generator is used as the video input signal for adjusting the video system in recording mode. Check that the sync signal and the color burst signal satisfy the specification specified during the adjustment set-up shown in Fig. 9-3.

[Adjusting procedure]

1) Playback frequency characteristic adjustment
2) Flying erase check
3) VXO oscillation frequency check
4) EE level adjustment
5) IR adjustment
6) Y/C separation adjustment
7) Emphasis input level adjustment
8) PB Y level adjustment
9) PB LINE OUT level adjustment
10) Y FM carrier frequency adjustment
11) Y FM deviation adjustment
12) Chroma emphasis fo adjustment
13) REC Y level adjustment
14) REC C level adjustment
15) REC ATF level check
16) REC AFM level check

1. Playback Frequency Characteristic Adjustment (VS-93 board)

Mode	Playback
Signal	Alignment tape: For frequency characteristic adjustment (WR5-6N)
Measurement Point	Refer to Fig. 6-7.
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	43 (1a-ch M.T), 45 (1b-ch M.T), 3F (2a-ch M.T), 41 (2b-ch M.T)
Specified Value	3.58 MHz level: 5.5 MHz level= 4: (3 ± 0.3)

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of each address of page D, and adjust the level ratio of 3.58 MHz and 5.5 MHz of each PB RF output waveform of 1a, 1b, 2a, 2b to the specified value.
   Note: After each address adjustment, be sure to press the PAUSE button of the adjusting remote control unit and memorize the data.

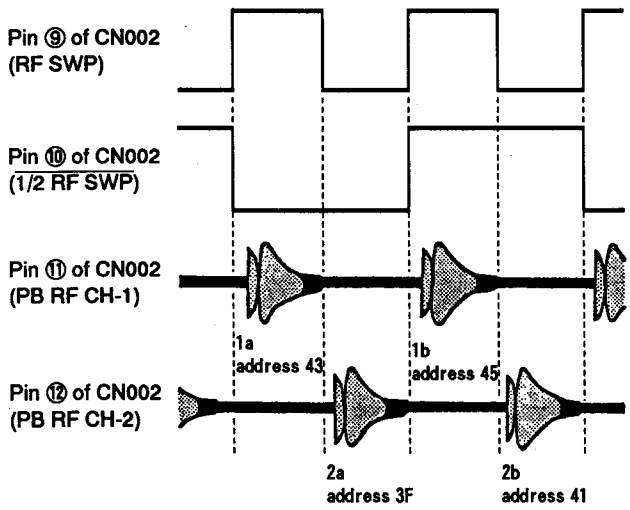


Fig. 9-7.

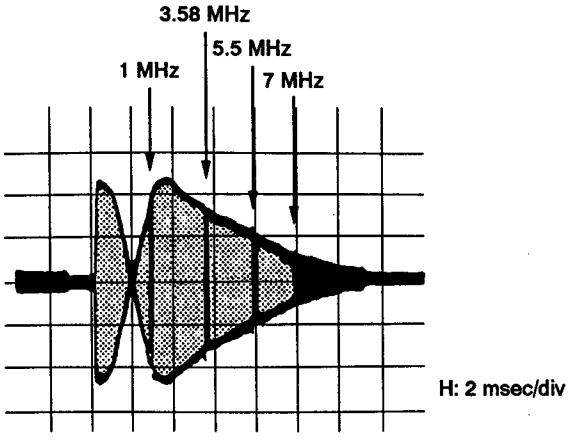


Fig. 9-8.

2. Flying Erase Check (VS-93 board)

Mode	Record
Signal	Arbitrary
Measurement Point	Pin ⑮ of CN001 (FE (X))
Measuring Instrument	Oscilloscope and frequency counter
Specified Value	Frequency: Above 7.0 MHz Voltage: Above 7.0 Vp-p

Note: Use a MP type tape.

Checking method:

1) Check that the oscillation frequency is above 7.0 MHz and that the oscillation voltage is above 7.0 Vp-p.

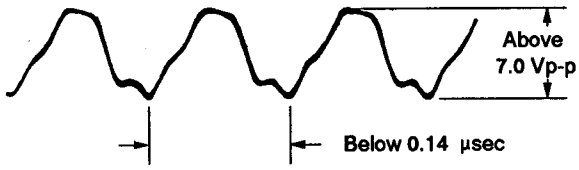


Fig. 9-9.

3. VXO Oscillation Frequency Check (VS-93 board)

Mode	Record
Signal	Color bar
Measurement Point	Pin ⑫ of IC152
Measuring Instrument	Frequency counter
Specified Value	3579545 ± 70 Hz

Note: Connect the frequency counter via a high impedance (approximately 10 MΩ) and low capacity (below 10 pF) buffer.

Adjusting method:

1) Check that the oscillation frequency of pin ⑫ of IC152 is 3579545 ± 70 Hz.

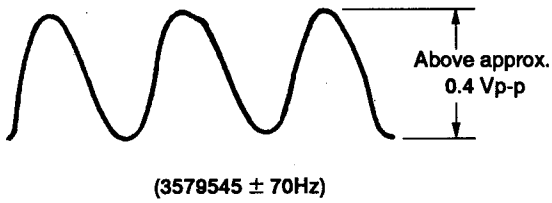


Fig. 9-10.

4. EE Level Adjustment (VS-93 board)

Mode	Record
Signal	Color bar
Measurement Point	Pin ⑤ of CN101 (VIDEO OUT)[Note]
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	4A (EE LEVEL)
Specified Value	A=1.00 ± 0.025V

Note: Terminate pin ⑤ of CN101 at 75 Ω .
After completing adjustments, remove the 75 Ω resistor.

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 4A, and adjust so that the Y signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

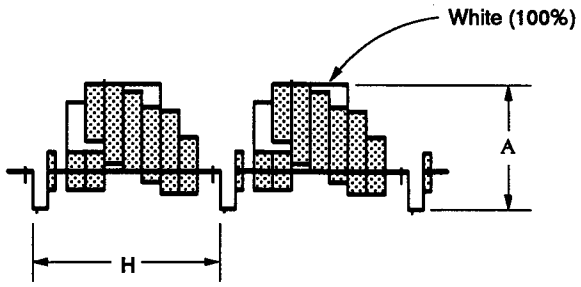


Fig. 9-11.

5. IR Adjustment (VS-93 board)

Mode	Record
Signal	Color bar
Measurement Point	Pin ⑦ of IC151 (Y COMB OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	4D (SR IR)
Specified Value	Residual chroma component (A) is minimum (below 50 mVp-p)

Connection

1) Connect pin ⑭ of IC151 (VG2: 2.5 Vdc) to pin ⑮ of IC151 with a jumper wire.

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 4D, and adjust so that the residual chroma component (A) becomes minimum.
3) Press the PAUSE button of the adjusting remote control unit.

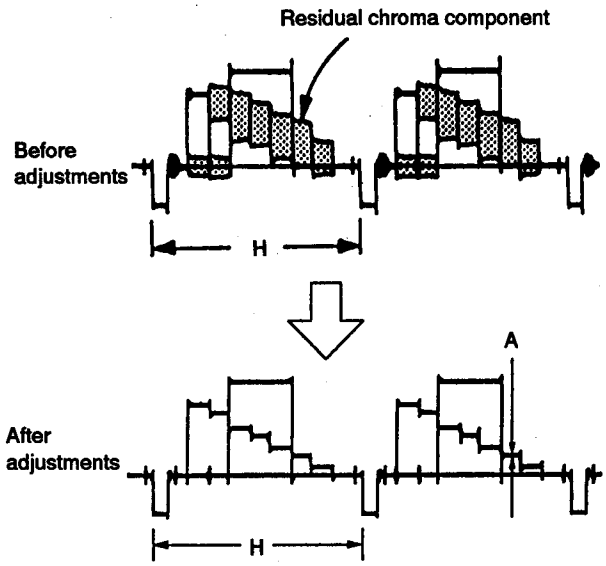


Fig. 9-12.

6. Y/C Separation Adjustment (VS-93 board)

Mode	Record
Signal	Color bar
Measurement Point	Pin ⑪ of IC151 (C+CD)
Adjusting Element	Oscilloscope
Measuring Instrument	RV151 (Phase)
Adjustment Page	D
Adjustment Address	4C (Y/C SER DL LEVEL)
Specified Value	Residual chroma component (A) is minimum.

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 4C, and adjust the residual chroma component to minimum.
3) Adjust RV151 so that the residual chroma component (A) becomes minimum.
5) Press the PAUSE button of the adjusting remote control unit.

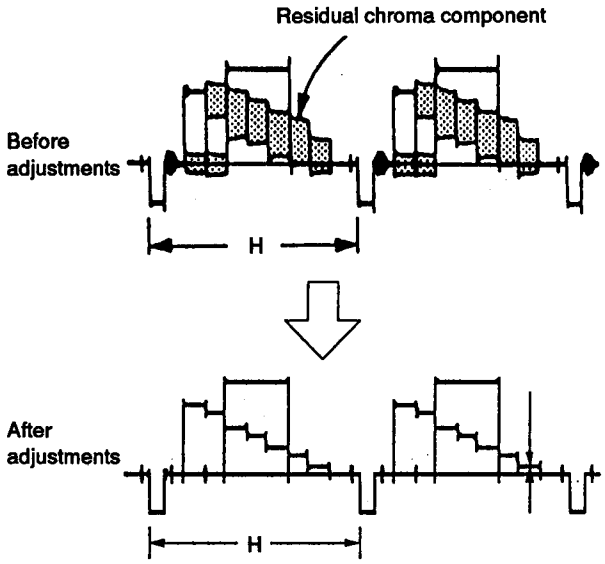


Fig. 9-13.

7. Emphasis Input Level Adjustment (VS-93 board)

Mode	Record
Signal	Color bar
Measurement Point	Pin ⑤ of IC155 (or Pin ③ of IC151)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	5A (EMPHASIS INPUT LEVEL)
Specified Value	A=0.50 ± 0.025V

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 5A, and adjust so that the Y signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

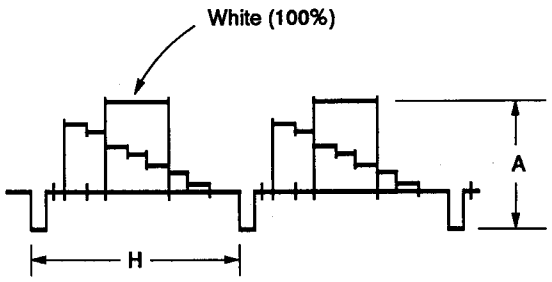


Fig. 9-14.

8. PB Y Level Adjustment (VS-93 board)

Mode	Playback
Signal	Alignment tape: For checking operations (WR5-5NSP) Color bar section
Measurement Point	Pin ㉑ of IC151
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	• Normal mode 59 (NORMAL PB Y LEVEL)
Specified Value	A=0.50 ± 0.025V

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Playback the color bar section of the normal mode alignment tape (WR5-5NSP).
3) Change the data of page: D, address: 59, and adjust so that the Y signal level (A) becomes the specified value.
4) Press the PAUSE button of the adjusting remote control unit.

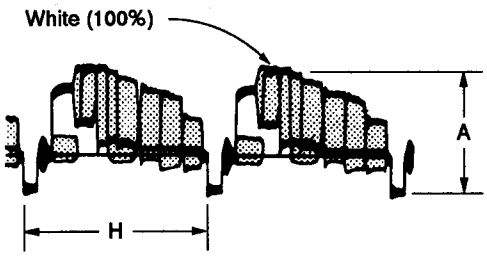


Fig. 9-15.

9. PB LINE OUT Level Adjustment

Mode	Playback
Signal	Alignment tape: For checking operations (WR5-5NSP) Color bar section
Measurement Point	Video output terminal (terminated at 75 Ω)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	5B (PB LINE LEVEL)
Specified Value	A=1.0 ± 0.025V

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 5B, and adjust so that the video signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

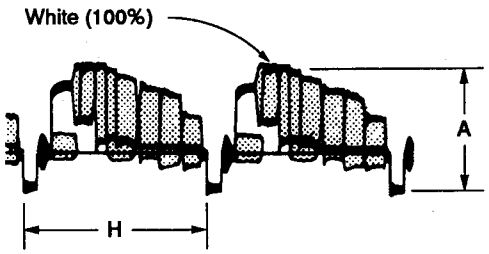


Fig. 9-16

10. Y FM Carrier Frequency Adjustment (VS-93 board)

Mode	Record
Signal	No signal
Measurement Point	Pin ⑤ of IC003 (REC Y RF OUT)
Measuring Instrument	Frequency counter
Adjustment Page	D
Adjustment Address	4F (Y FM CARRIER)
Specified Value	4.38 ± 0.04 MHz

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 4F, and adjust so that the Y FM carrier frequency becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.
4) Perform "Deviation Adjustment".

Pin ⑤ of IC003 waveform

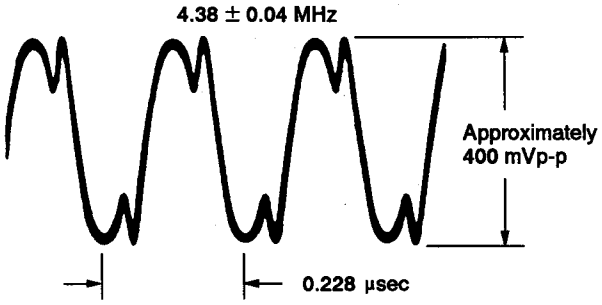


Fig. 9-17.

11. Deviation Adjustment (VS-93 board)

Mode	Record and playback
Signal	Color bar
Measurement Point	Pin ㉑ of IC151
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	51 (Y FM DEVIATION)
Specified Value	A=0.50 ± 0.025V

Note: Check that "Emphasis Input Level Adjustment", "PB Y Level Adjustment" and "Y FM Carrier Frequency Adjustment" have been completed.

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Record the color bar signal.
3) Playback the recorded signal.
4) Check the playback signal level (A).
   Specification:A=0.50 ± 0.025V
5) If the specification is not satisfied, change the data of page: D, address: 51, and repeat steps 2) to 4).

Playback signal level	Changing the data
When smaller than the specified value	Increase
When bigger than the specified value	Decrease

6) Press the PAUSE button of the adjusting remote control unit.

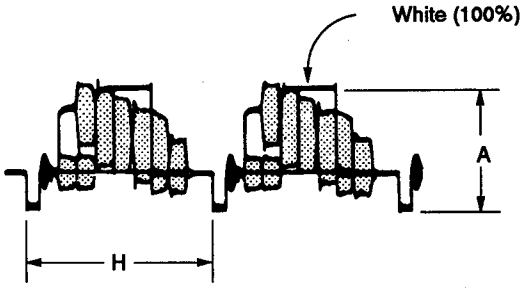


Fig. 9-18.

12. Chroma Emphasis fo Adjustment (VS-93 board)

Mode	Record
Signal	Color bar
Measurement Point	Pin ㉔ of IC152
Measuring Instrument	Oscilloscope
Adjustment Element	FL153
Specified Value	Minimum fo component

Connection:

1) Connect pin ㉔ of IC152 to GND with a 2.2 kΩ resistor (1-249-421-11).

Adjusting method

1) Adjust FL153 so that the amplitude of the latter section of the chroma signal (yellow section) becomes minimum.

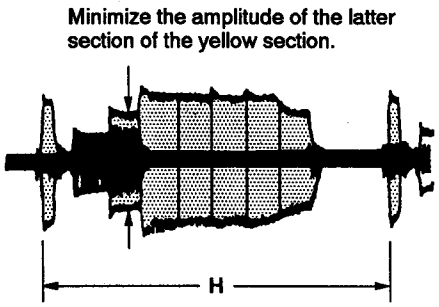


Fig. 9-19.

13. REC Y Level Adjustment (VS-93 board)

Mode	Record
Signal	No signal
Measurement Point	Pin ⑤ of IC003
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	55 (REC Y LEVEL EE NOR MP) 54 (REC Y LEVEL EE NOR ME) 53 (REC Y LEVEL EE Hi8 MP) 52 (REC Y LEVEL EE Hi8 ME)
Specified Value	A=400 ± 10 mVp-p

Note: Use a MP type tape.

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 55, and adjust so that the Y signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.
4) Set the data of page: D, address: 55 to page: D, address: 54.
5) Press the PAUSE button of the adjusting remote control unit.

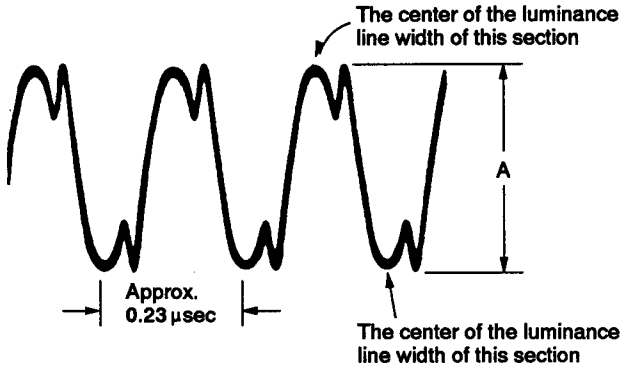

The center of the luminance line width of this section
A
Approx.
0.23 µsec
The center of the luminance line width of this section

Fig. 9-20.

14. REC C Level Adjustment (VS-93 board)

Mode	Record
Signal	Color bar
Measurement Point	Pin ⑦ of CN002
Measuring Instrument	Oscilloscope (1:1 probe)
Adjustment Page	D
Adjustment Address	31 (MP REC C LEVEL) 30 (ME REC C LEVEL)
Specified Value	A=62 ± 2 mVp-p

Note: Use a MP type tape.

Connection:

1) Remove the AU-135 board CN601.
2) Connect the connecting point of R401 and R402 (the side of IC401 ⑱ pin) to GND with a jumper wire.

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) To reduce the REC Y signal, set data: 00 to page: D, address: 55.
   Note: Don't press the PAUSE button of the adjusting remote control unit.
3) Change the data of page: D, address: 31, and adjust so that the REC C level (A) becomes the specified value.
4) Press the PAUSE button of the adjusting remote control unit.
5) Set the same data of address: 31 to address: 30.
6) Press the PAUSE button of the adjusting remote control unit.
7) Turn the main power supply (6.3V) off.

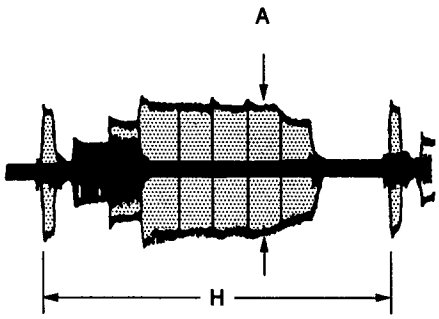


Fig. 9-21.

15. REC ATF Level Check (VS-93 board)

Mode	Record
Signal	No signal
Measurement Point	Pin ⑦ of CN002 (REC 1A)
Measuring Instrument	Oscilloscope
Specified Value	A=12.5 ± 3 mVp-p

Note: Use a MP type tape.

Connection:

1) Remove the AU-135 board CN601.

Checking method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) To reduce the REC Y signal, set data: 00 to page: D, address: 55.
   Note: Don't press the PAUSE button of the adjusting remote control unit.
3) Check that the REC ATF signal level (A) satisfies the specified value.
4) Turn the main power supply (6.3V) off.

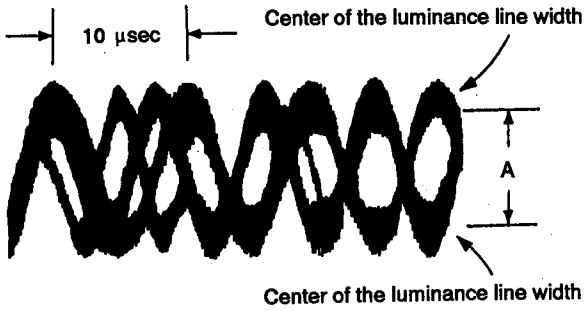


Fig. 9-22.

16. REC AFM Level Check (VS-93 board)

Mode	Record
Signal	No signal
Measurement Point	Pin ⑦ of CN002 (REC 1A)
Measuring Instrument	Oscilloscope
Specified Value	A=14.5 ± 3 mVp-p

Note: 1) Use a MP type tape.
2) Do not insert anything into the audio input terminal (left).

Connection:

1) Connect the connecting point of R401 and R402 (the side of IC401 ㊽ pin) to GND with a jumper wire.

Checking method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) To reduce the REC Y signal, set data: 00 to page: D, address: 55.
   Note: Don't press the PAUSE button of the adjusting remote control unit.
3) Check that the REC AFM signal level (A) satisfies the specified value.
4) Turn the main power supply (6.3V) off.

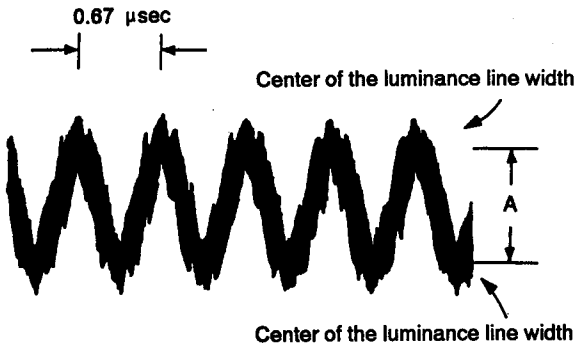


Fig. 9-24.

9-6. AUDIO SYSTEM ADJUSTMENT

- Perform the adjustment using the color bar signal as a video signal input.

[Connecting the measuring instruments for the audio]

Connect the audio system measuring instruments besides the video system measuring instruments as shown in Fig. 9-25, and perform adjustments with the power switch [video] position.
Switch the input/output switchover switch in accordance with the mode as follows.

- Input position·····Recording mode
- Output position·····Playback mode

Adjust the bilingual switch (CF-3200 board S12) to the following position unless specified otherwise.

- Green (stereo) position
  Use an extension cord if necessary.
- For AU-135 board (30P, 0.8 mm)
  Part code: J-6082-135-A

Note: 1) When inputting the audio signal, input the same signal to both L, and R channels, unless specified otherwise.
2) Be sure to insert the plug (shorting plug or dummy plug, etc.) into the audio input/output terminal (right). If the plug is not inserted, the unit will be set into the monaural mode, and correct adjustments cannot be carried out.
(Monaural mode)
During recording·· REC AFM RF1.7 MHz carrier will not be output.
During playback·· The L+R signal will be output from the audio input/output terminal (left).
3) The items to be adjusted for the R channel will be indicated within the [ ], in regard to the adjusting items to be adjusted for both L and R channels.

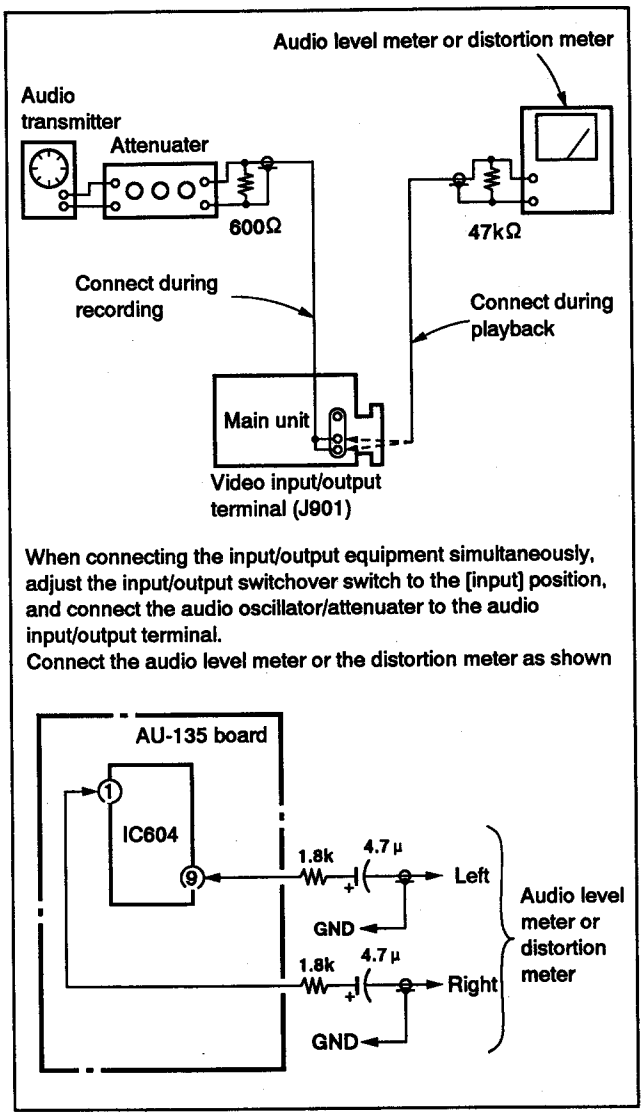


Fig. 9-25.

[Adjustment Procedure]

1) IR adjustment
2) 1.5 MHz carrier frequency check
3) 1.7 MHz carrier frequency check
4) 1.5 MHz recording level check
5) 1.7 MHz recording level check
6) E-E output level check
7) REC matrix L–R check
8) REC matrix L+R check
9) 1.5 MHz deviation adjustment
10) 1.7 MHz deviation adjustment
11) PB matrix L adjustment
12) PB matrix R adjustment
13) Overall level characteristics, distortion check
14) Separation check
15) Overall noise level check

1. IR Adjustment (AU-135 board)

Mode	Playback
Signal	Alignment tape: AFM stereo For checking operations (WR5-9NS)
Measurement Point	Pins ㊹ and ⑥ of IC601 (LCH IR) Pins ㊹ and ⑥ of IC602 (RCH IR)
Measuring Instrument	Digital voltmeter
Adjustment Page	D
Adjustment Address	7A (1.5 IR), 7C (1.7 IR)
Specified Value	The DC voltage difference between pins ㊹ and ⑥ is 0 ± 10 mVdc

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01

• LCH IR adjustment

2) Connect the digital voltmeter to pin ㊹ of IC601, and read the voltage. (Approximately 2100 mVdc)
3) Connect the digital voltmeter to pin ⑥ of IC601.
4) Change the data of page: D, address: 7A, and adjust so that the voltage of pin ⑥ of IC601 becomes equal to the voltage of pin ㊹. (Voltage difference below 10 mVdc)
5) Press the PAUSE button of the adjusting remote control unit.

• RCH IR adjustment

6) Connect the digital voltmeter to pin ㊹ of IC602, and read the voltage. (Approximately 2100 mVdc)
7) Connect the digital voltmeter to pin ⑥ of IC602.
8) Change the data of page: D, address: 7C, and adjust so that the voltage of pin ⑥ of IC602 becomes equal to the voltage of pin ㊹. (Voltage difference below 10 mVdc)
9) Press the PAUSE button of the adjusting remote control unit.

2. 1.5 MHz Carrier Frequency Check (AU-135 board)

Mode	Record
Signal	No signal
Measurement Point	Pin ⑧ of IC601
Measuring Instrument	Frequency counter (Note 1)
Specified Value	1.500 ± 0.002 MHz

Note: Use a high impedance (above 1 MΩ) and low capacity (below 20 pF) probe.

Checking method:

1) Check that the 1.5 MHz carrier frequency satisfies the specified value.

3. 1.7 MHz Carrier Frequency Check (AU-135 board)

Mode	Record
Signal	No signal
Measurement Point	Pin ⑧ of IC602
Measuring Instrument	Frequency counter (Note 1)
Specified Value	1.700 ± 0.002 MHz

Note: 1) Use a high impedance (above 1 MΩ) and low capacity (below 20 pF) probe.
2) Insert a shorting plug into the audio input terminal (right).

Checking method:

1) Check that the 1.7 MHz carrier frequency satisfies the specified value.

4. 1.5 MHz Record Level Check (AU-135 board)

Mode	Record (Monaural)
Signal	No signal
Measurement Point	Pin ② of CN601 (REC AFM)
Measuring Instrument	Oscilloscope
Specified Value	A=41 ± 5 mVp-p

Note: Do not insert the plug into the audio input terminal (right).

Checking method:

1) Check that the 1.5 MHz carrier level satisfies the specified value.
   (Read the center of the luminance line width and note down the level read.)

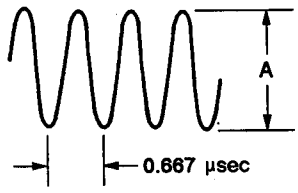


Fig. 9-26.

5. 1.7 MHz Record Level Check (AU-135 board)

Mode	Record
Signal	No signal
Measurement Point	Pin ② of CN601 (REC AFM)
Measuring Instrument	Oscilloscope
Specified Value	$\frac{\text{1.7 MHz carrier level}}{\text{1.5 MHz carrier level}} = 0.80 \pm 0.12$

Note: Insert a shorting plug into the audio input terminal (right).

Connection:

1) Remove and check C690 (0.01 μF). After checking, connect a new capacitor.

Checking method:

1) Check that the level ratio of 1.5 MHz carrier and 1.7 MHz carrier satisfies the specified value.

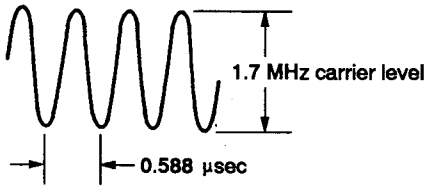


Fig. 9-27.

6. E-E Output Level Check (AU-135 board)

Mode	Record
Signal	400 Hz, –7.5 dBs audio input terminal right [left]
Measurement Point	Pin ⑨ of IC604 [Pin ① of IC604]
Measuring Instrument	Oscilloscope
Specified Value	$925\ ^{+240}_{-190}$ mVp-p (–7.5 ± 2 dBs)

Checking method:

1) Check that the 400 Hz signal level satisfies the specified value.

7. REC Matrix L-R Adjustment (AU-135 board)

Mode	Record
Signal	400 Hz, –7.5 dBs Input to both left and right terminals of the audio input terminal
Measurement Point	Pin ③ of IC603
Measuring Instrument	Oscilloscope (Use 1:1 probe)
Adjustment Page	D
Adjustment Address	78 (L/R MX LEVEL (REC))
Specified Value	0 ± 5 mVp-p

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 78, and minimize the 400 Hz signal level.
3) Press the PAUSE button of the adjusting remote control unit.

8. REC Matrix L+R Check (AU-135 board)

Mode	Record
Signal	1. 400 Hz, –7.5 dBs: Audio input terminal left No signal: Audio input terminal right 2. No signal: Audio input terminal left 400 Hz, –7.5 dBs: Audio input terminal right
Measurement Point	Pin ㉕ of IC603
Measuring Instrument	Oscilloscope
Specified Value	The level difference is 0 ± 10 mVp-p when only the left terminal is input and when only the right terminal is input.

Note: When measuring the signal level of pin ㉕ of IC603, wait for more than 1 minute after signal input before measuring. (To stabilize the AGC)

Adjusting method:

1) Input the 400 Hz, –7.5 dBs signal only to the audio input terminal (left). (Insert the shorting plug to the audio input terminal (right).)
2) Read the 400 Hz signal level of pin ㉕ of IC603, and take it down. (Approximately 200 mVp-p)
3) Input the 400 Hz, –7.5 dBs signal only to the audio input terminal (right). (Insert the shorting plug to the audio input terminal (left).)
4) Check that the 400 Hz signal level of pin ㉕ of IC603 (the value that was taken down at step 2) is ± 10 mVp-p.

9. 1.5 MHz Deviation Adjustment

Mode	Playback
Signal	Alignment tape: For checking the operation (WR5-5NSP)
Measurement Point	Audio output terminal left or right
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	7B (1.5 DEV)
Specified Value	–7.5 ± 0.5 dBs

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 7B, and adjust so that the 400 Hz signal level becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

10. 1.7 MHz Deviation Adjustment (AU-135 board)

Mode	Playback
Signal	Alignment tape: AFM stereo For checking operations (WR5-9NS) Bilingual (Monoscope) section
Measurement Point	1. Pin ⑨ of IC604 2. Pin ① of IC604
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	7D (1.7 DEV)
Specified Value	8 ± 0.05 graduation

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Connect the oscilloscope to pin ⑨ of IC604.
3) Adjust the 400 Hz signal amplitude to the 8.0 graduation using the VOLT/DIV knob of the oscilloscope.
4) Connect the oscilloscope to pin ① of IC604.
5) Change the data of page: D, address: 7D, and adjust so that the 1 kHz signal level becomes 8 ± 0.05 graduation. (Adjust with the center of the luminance line width.)
6) Press the PAUSE button of the adjusting remote control unit.

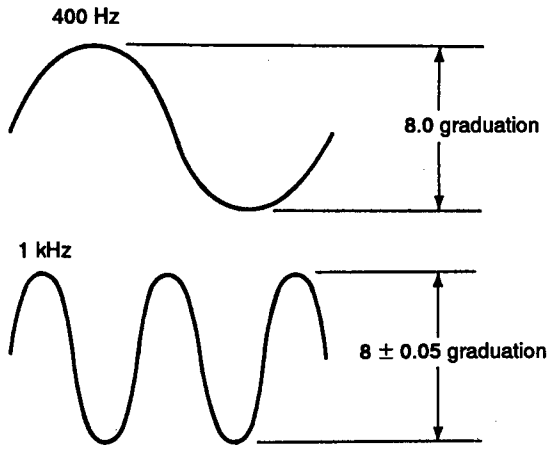


Fig. 9-28.

11. PB Matrix L Adjustment (AU-135 board)

Mode	Self recording/playback
Signal	No signal: Audio input terminal (left) 400 Hz, –7.5 dBs: Audio input terminal (right)
Measurement Point	Pin ⑨ of IC604
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	79 (L/R MX LEVEL (PB))
Specified Value	Below 20 mVp-p

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Input the 400 Hz, –7.5 dBs signal only to the audio input terminal (right). (Insert the shorting plug to the audio input terminal (left).)
3) Record.
4) Remove the input signal.
5) Playback the recorded section.
6) Change the data of page: D, address: 79, and minimize the cross talk component (400 Hz).
7) Press the PAUSE button of the adjusting remote control unit.

12. PB Matrix R Check (AU-135 board)

Mode	Self recording/playback
Signal	400 Hz, –7.5 dBs: Audio input terminal (left) No signal: Audio input terminal (right)
Measurement Point	Pin ① of IC604
Measuring Instrument	Oscilloscope
Specified Value	Below 30 mVp-p

Checking method:

1) Input the 400 Hz, –7.5 dBs signal only to the audio input terminal (left). (Insert the shorting plug to the audio input terminal (right).)
2) Record.
3) Remove the input signal.
4) Playback the recorded section.
5) Check that the cross talk component (400 Hz) is below 30 mVp-p.

13. Overall Level Characteristic, Distortion Check

Mode	Self recording/playback
Signal	400 Hz, –7.5 dBs: Audio input terminal (left) [right] No signal: Audio input terminal (right) [left]
Measurement Point	Audio output terminal (left) [right]
Measuring Instrument	Audio level meter and distortion meter
Specified Value	Level: –8.5 ± 2 dBs Distortion rate: Below 0.8% (Note 2)

Note: 1) The [ ] indicates the measuring point during the right channel check
2) Value when the following filter is used

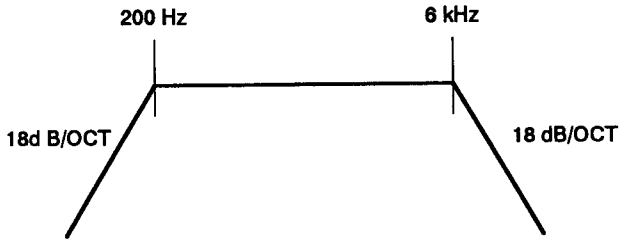


Fig. 9-29.

Checking method:

1) Input the 400 Hz, –7.5 dBs signal only to the audio input terminal (left) [right].
   Note: Be sure to insert the shorting plug to the terminal that was not signal input.
2) Record the signal.
3) Remove the input signal, and adjust the input/output switchover switch to [out].
4) Playback the recorded section.
5) Check that the 400 Hz signal level of the audio output terminal (left) [right] is –8.5 ± 2 dBs, and that the distortion rate is below 0.8% (Note 2).

14. Separation Check

Mode	Self recording /playback
Signal	No signal: Audio input terminal (left) [right] 1 kHz, –7.5 dBs: Audio input terminal (right) [left]
Measurement Point	Audio output terminal (left) [right]
Measuring Instrument	Audio level meter (Use an IHF-A curve audio correction filter)
Specified Value	Below –27.5 dBs

Note: The [ ] indicates the measuring point during the right channel check.

Checking method:

1) Insert a shorting plug into the audio input terminal (left) [right], and input a 1kHz, –7.5 dBs signal only to the audio input terminal (right) [left].
2) Record the signal.
3) Remove the input signal, and adjust the input/output switchover switch to [out].
4) Playback the recorded section.
5) Check that the cross talk level (1 kHz) of the audio output terminal (left) [right] is below –27.5 dBs.

15. Overall Noise Level Check

Mode	Self recording
Signal	No signal: Audio output terminal left and right
Measurement Point	Audio output terminal (left) [right]
Measuring Instrument	Audio level meter (Use an IHF-A curve auditory correction filter)
Specified Value	Below –65.0 dBs

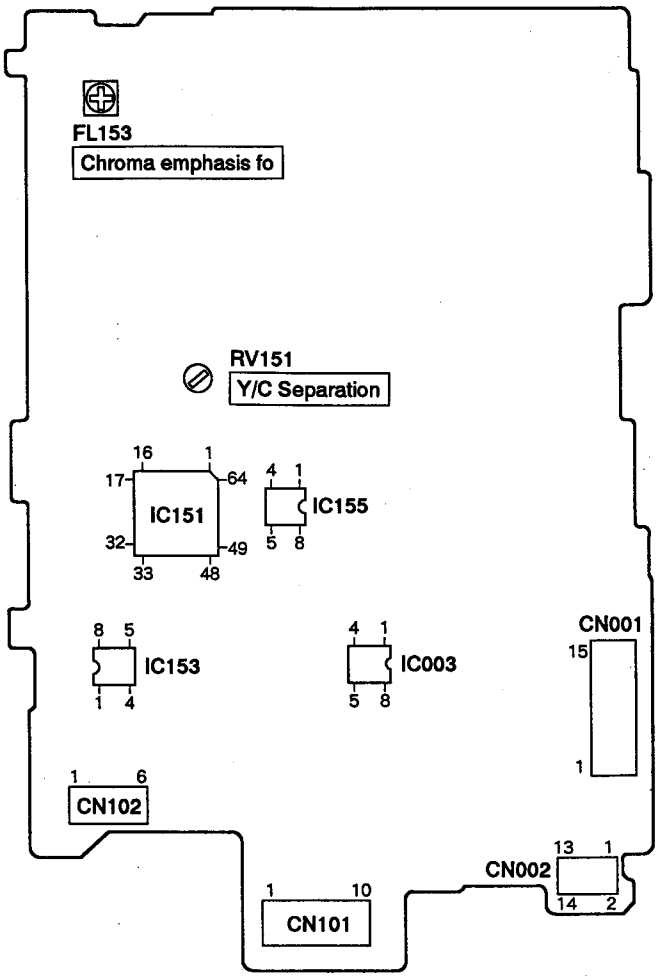
Note: The [ ] indicates the measuring point during the right channel check.

Checking method:

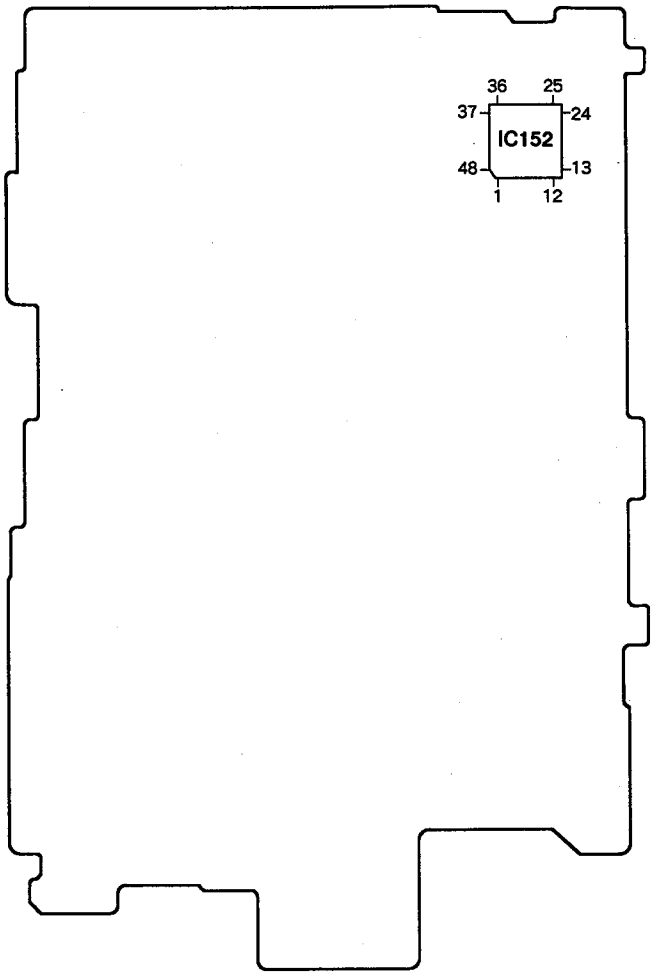
1) Insert the shorting plug to both left and right of the audio input terminals.
2) Record.
3) Remove the shorting plug, and adjust the input/output switchover switch to [out].
4) Playback the recorded section.
5) Check that the noise level of the audio output terminal (left) [right] is below –65.0 dBs.

9-7. ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS

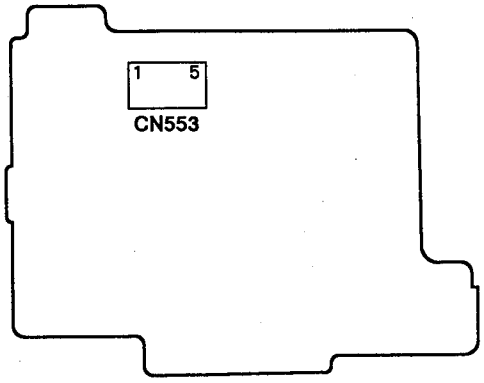
VS-93 BOARD (COMPONENT SIDE)



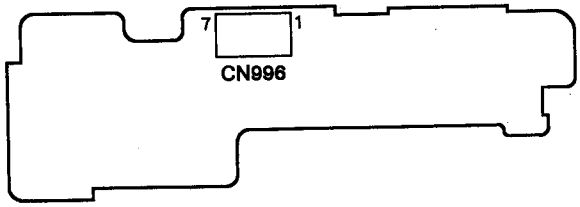
VS-93 BOARD (CONDUCTOR SIDE)



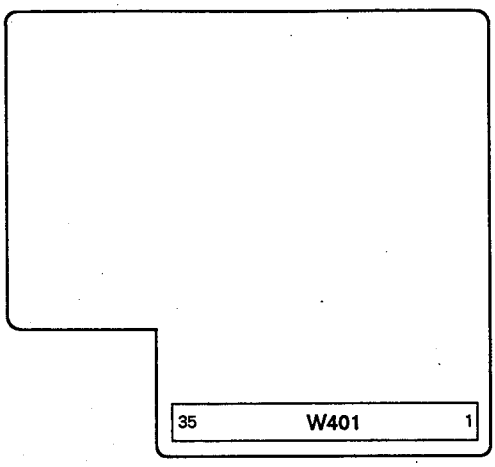
MA-143 BOARD (COMPONENT SIDE)



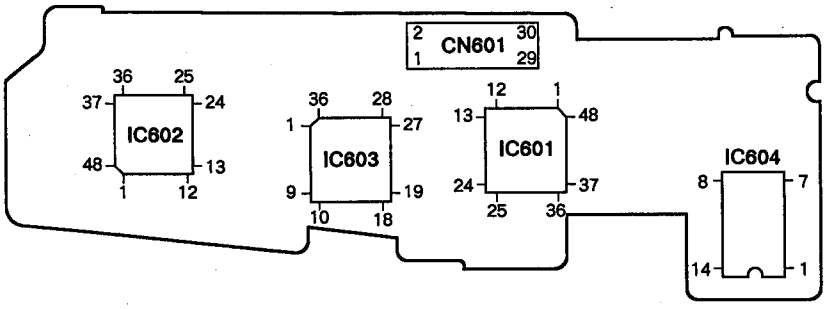
MF-175 BOARD (CONDUCTOR SIDE)



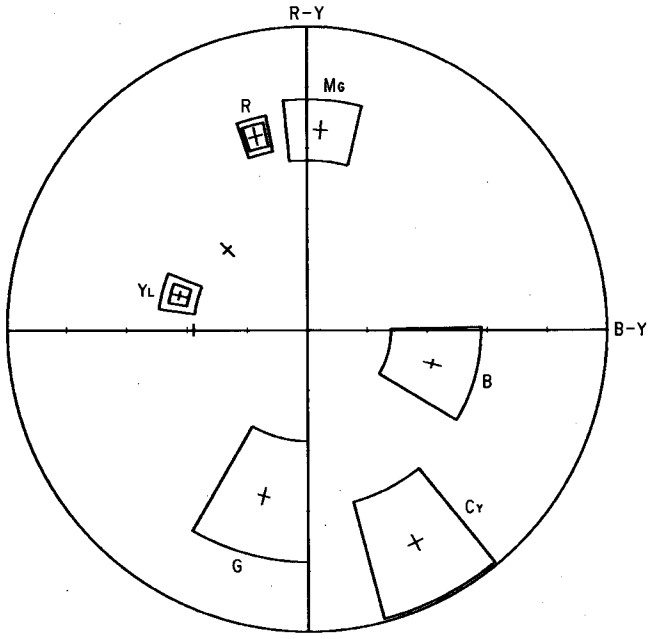
DD-47 BOARD (COMPONENT SIDE)



AU-135 BOARD (CONDUCTOR SIDE)



FOR CAMERA COLOR REPRODUCTION ADJUSTMENT



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